

The Truth About Abdominal Exercises for Pre and Post Pregnancy

Presented By: Leah Stewart, M.S.

For pregnant women, new mothers and Pilates professionals alike, there is much confusion about what happens to the abdominal muscles during pregnancy and labor, and how it effects pre and post natal Pilates abdominal exercise choices and modifications. Although pre and post natal Pilates programming involves much more than abdominal work, it is often the confusion and misunderstanding about how to continue abdominal exercises during and after pregnancy that has created fear and doubt among both Pilates professionals and practitioners; limiting the many wonderful opportunities of using Pilates as a powerful tool to empower women before and after their pregnancies.

Here's what we are going to accomplish during this workshop:

1. Explain exactly happens to the abdominal muscles during pregnancy through a description of the anatomy of the abdominal muscles
2. An analysis of a diastasis recti and it's cause and effect on pre and post natal Pilates exercise choices
3. The importance of continued abdominal training during and after pregnancy
4. How to create creative, safe and effective abdominal exercise modifications for yourself or your pre and post natal clients
5. Participate in two short pre and post natal Pilates mat classes

What Happens to the Abdominals During and After Pregnancy?

During pregnancy

The abdominals and their connective tissues, which includes the linea alba, are designed to stretch and expand to accommodate the growing uterus and baby. This is a natural process, which can not be stopped. The hormones progesterone and relaxin aid in this natural process by creating:

1. The softening of the connective tissue (ligaments, tendons and muscles)
2. A decrease of muscle tone during pregnancy

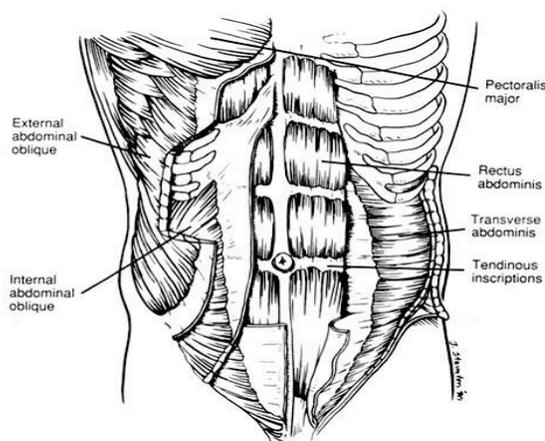
A prenatal Pilates program should utilize abdominal exercises that strive to obtain adequate abdominal support and strength for postural control and childbirth, rather than those that emphasize tight, toned muscles. On the other hand, when abdominal support and strength is not adequate during pregnancy it may alter the baby's position, lower back and pelvic support, postural control and the assistance of the abdominals during labor. A postnatal Pilates program

should focus on abdominal exercises that promote the re-strengthening and re-connecting of the abdominal muscles and connective tissues.

First, let's review the abdominal muscles:

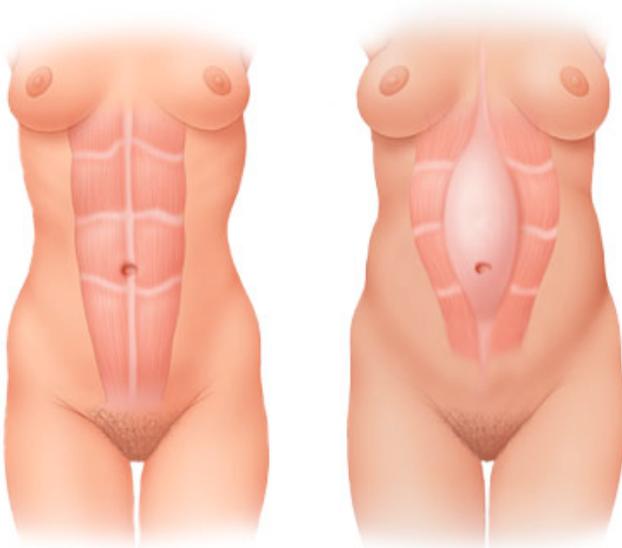
The abdominal wall is comprised of four different paired muscles each with a right and left side, and together they cover and support the entire abdominal cavity. The muscles include the rectus abdominis, external obliques, internal obliques and transverse abdominis.

- The **rectus abdominis** is the most superficial of the group and runs directly up and down, vertically in the center of the abdomen. This is the “six pack” muscle, and in traditional abdominal exercise routines receives the most attention because it's primary function is to produce spinal flexion or a forward bend of the spine.
- The **external and internal obliques** are the muscles that run diagonally from the sides of the abdomen, at the ribs toward the midline. As the name implies, the external oblique muscles lie over the internal oblique muscles. Together the external and internal obliques produce trunk rotation and lateral flexion or side bending of the spine. The oblique muscles can also help to flatten the abdominal wall and help to create spinal stability.
- The **transverse abdominis** wraps around the torso horizontally from back to front. The transverse abdominis is responsible for the narrowing of the waist and along with the obliques the compression of the abdominal wall. The transverse abdominis is also particularly important for providing core stabilization, which is vital for functional movement, postural control and alignment and healthy back care.



As pregnancy progresses, the dimensions and growing weight of the uterus inevitably influences the musculoskeletal morphology of the pregnant woman:

1. As the lower thoracic diameter increases during the course of pregnancy, the spatial relationship of superior and inferior abdominal muscles attachments are altered.
2. Increased in overall muscle length (particularly that of the rectus abdominus) is seen due to the changes in the anterior and lateral dimensions during pregnancy.
3. Increasing anterior abdominal dimensions may alter the angle of the abdominal wall muscles attachments in the sagittal and coronal planes, resulting in:
 - The rectus abdominus muscles to move laterally rather than vertically across the torso.
 - This alteration of the aponeurotic and bony attachments changes the muscles' line of pull and possibly their ability to produce torque
 - The widening of the linea alba



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How do these musculoskeletal changes effect movement?

1. It is important to remember that these changes happen slowly, over time. Modifications to exercises will happen slowly and gradually as the uterus grows, the belly expands and as the abdominal muscles and linea alba change and adapt.
2. The separation of the abdominal muscles and the widening of the linea alba begins to occur sometime during the second trimester.
 - One study shows that a separation width in it's subjects was not evident at 14 weeks gestation, began to show at the umbilicus by week 26, above the umbilicus at week 30 and below the umbilicus by week 34.

3. Because the lengthening of the abdominals, particularly the rectus abdominus, occurs over time during pregnancy, the normal length-tension relationship, which states that an overstretched muscle is unable to produce normal amounts of tension, may not necessarily apply. Rather, the decrease in the abdominal muscles ability to produce adequate force later into pregnancy may be a result of the altered line of pull (due to the changes in muscle placement) rather than the overstretching of the abdominal muscles. More research needs to be conducted on this theory.
4. One study found that the torque production of the rectus abdominus may be reduced by 30 weeks gestation due to the altered line of pull, therefore compromising the ability of the muscle to flex the trunk properly, if at all.
5. During pregnancy, the growing uterus presents a significant physical obstruction, which greatly alters the ability to perform certain abdominal exercises safely and comfortably. When traditional abdominal exercises (supine trunk flexion) are performed mid to late pregnancy the uterus is pressed up and against the already stressed abdominal wall, creating more pressure and stretch, which could result in further separation. Traditional Pilates abdominal exercises should be avoided during the 2nd and 3rd trimesters.
6. The functional ability of the abdominals to assist in pelvic stabilization is also altered as the abdominal muscles separate and the angles of insertion and line of pull are altered.

After Birth

After the stresses of pregnancy and labor, the abdominal muscles have been stretched to their maximum and are often left soft and lax. It takes a long time to stretch the abdominal muscles during pregnancy, allowing for the muscles to adapt slowly to the growing pressure of the uterus.

By comparison, labor and it's effects on the body happens fairly quickly. After labor, there is a sudden release of the uterine stretch on the abdominal muscles, leaving them greatly increased in length.

One study found that the separation and widening of the abdominal muscles and linea alba after birth returned to that of weeks 22 - 26 gestation.

How does the anatomical and musculoskeletal changes of the early postpartum period effect movement?

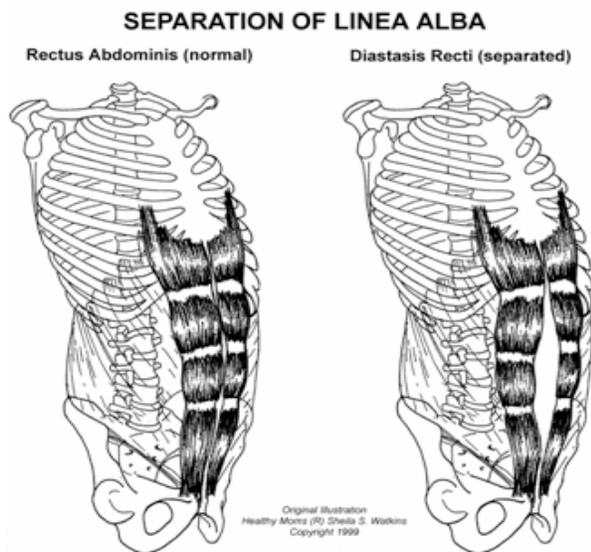
1. There is a compromised ability for the muscles to produce adequate tension to perform certain abdominal exercises and ranges of motion, resulting from an altered length-tension relationship.
2. There is an inability to provide sufficient support of the pelvis and the abdominal wall.

Diastasis Recti

A diastasis recti is a condition where the rectus abdominus muscle separates in the middle at the linea alba, which is a piece of connective tissue that runs directly down the center of the torso from the xiphoid process to the pubic symphysis.

During pregnancy, the linea alba widens and thins due to the pressure and tension of the expanding uterus and the pregnancy hormones that soften it, predisposing it to separation. The thinning of the linea alba can lead to a diastasis recti, which is a common occurrence during late pregnancy and in early postpartum period.

A diastasis recti may be slight or severe depending on the width of the separation and/or the condition of the tissue. A 1 - 2 finger tip separation between the rectus abdominus muscles at the linea alba directly after birth is considered normal. A separation larger than 2 finger tips is considered a mild to severe diastasis recti and exercise considerations and modifications need to be made.



How does a diastasis recti affect movement?

1. A significant diastasis recti (or even a small one made larger by poor exercise choices) effect the overall integrity of the functionality of the abdominal muscles by altering their role in:
 - Postural support and control
 - Trunk and pelvic stability
 - Delivery of the baby
 - Preventing lower back pain
 - Respiration
 - Producing flexion, rotation and lateral flexion of the trunk

2. In very severe cases, a diastasis recti in combination with poor movement and exercise choices may result in herniation of the abdominal wall. In these severe cases the abdominal wall is composed of only a layer of skin, attenuated fascia and periosteum.
3. There are certain movements that should be avoided due to the compromised ability of the contractile properties of the abdominals resulting from a diastasis recti. With a diastasis recti the abdominal muscles are not able to support or create the following movements with safety or integrity:
 - Traditional spinal flexion where the head, neck and chest lift off the mat
 - Abdominal exercises with traditional flexion and rotation
 - Exercises where straight legs lower toward the floor

A diastasis recti can be observed above, at or below the umbilicus, but it is most often seen at the umbilicus. A diastasis recti begins to appear in the second trimester, reaches its peak in the third trimester and remains in the immediate and sometimes later postpartum period.

How to test for diastasis recti:

- Lie in a supine position with knees bent and feet on the floor
- Place one hand behind your head and the other with fingertips facing down across the midline. Sink your fingertips down into your belly just above the belly button
- Lift your head and shoulders slightly off the floor as you contract your abdominals. You may be able to feel a gap between the two sides of the rectus abdominus
- Assess how many finger tips fit into the gap; the more fingers the more severe the diastasis recti
- Then perform the test with the fingertips just below and then at the belly button

So, why should we continue to do abdominal exercises during and after pregnancy?

1. The abdominal muscles play an important role in pregnancy and childbirth by:
 - Helping a woman maintain ideal postural alignment during pregnancy
 - Proper stability and positioning of the pelvis and lumbar spine
 - Helping to insure the correct positioning of the baby
 - Assisting in the labor during the “pushing” process
 - The prevention of unnecessary or excessive lower back pain
2. The abdominal muscles need proper reconditioning after pregnancy and labor to:
 - Help facilitate the shortening of the over-lengthened abdominal muscle fibers so that they can regain strength for movement and support
 - Help a woman establish ideal postural alignment after pregnancy
 - Help a woman establish good body mechanics when caring for her newborn child (picking up, holding, nursing, rocking, etc)

- Prevent or lessen the common pelvic and low back pain that often occurs in the initial postpartum period

Creating Creative, Safe and Effective Pre and Post Natal Abdominal Exercise Modifications

Continuing abdominal work during pregnancy and the initial period after labor is important and vital for functional ability, healing and comfort. Not all Pilates abdominal exercises are created equal, particularly when it comes to pre and post natal Pilates. Although there are certain ranges of motion and types of abdominal exercises to avoid, there are many wonderful movement and exercise options to insure that the abdominal muscles are utilized and challenged effectively during and after pregnancy.

Safe abdominal exercises and modifications include the following:

1. Seated Roll Down/Pelvic Tilt Exercises

2. Supine Pelvic Tilt Exercises (before 20 weeks gestation)

3. Non-Supine Trunk Flexion Exercises

4. Lateral Flexion Exercises

5. Trunk and Pelvis Stability Exercises

6. Seated Rotation Exercises

Let's explore modifications for the following traditional and popular Pilates abdominal exercises.

Mat Work

1. Chest Lift

Objective:

Modification exploration:

2. Double Leg Stretch

Objective:

Modification exploration:

3. Criss Cross

Objective:

Modification exploration:

Reformer

1. The Hundred Prep/Hundred

Objective:

Modification exploration:

2. Abdominals with Legs in Straps/With Rotation

Objective:

Modification exploration:

3. Sides Over

Objective:

Modification exploration:

Additional exercises:

THANK YOU FOR PARTICIPATING IN THIS WORKSHOP!

If you have any questions, please contact me at:

leah@livelifepilates.com

www.pilatesfornewmothers.com

