Prenatal Yoga Teacher Training

Prenatal Stages and Fetal Development

By: Nancy Wile
Yoga Education Institute

© Yoga Education Institute, 2012
All rights reserved. Any unauthorized use, sharing, reproduction, or distribution of these materials by any means is strictly prohibited.
Pregnancy and Fetal Development

The development of pregnancy is counted from the first day of the woman’s last normal period, even though the development of the fetus does not begin until conception. Pregnancy is calculated from this day because each time a woman has a period, her body is preparing for pregnancy.

Pregnancy is also divided into trimesters, which last about 12 - 14 weeks each. Similar to development, these can be calculated from different dates so not all trimester calculations will equal the same. The following information divides the three trimesters into a little over 3 completed months each. The first trimester is week 1 through the end of week 13. The second trimester usually ends around the 26th week and consists of the 4th, 5th and 6th completed months. The third trimester can end anywhere between the 38th – 42nd week and is the 7th, 8th and 9th completed months of pregnancy.

First Trimester Development
Gestational Age – Week 1 and 2
A woman’s menstrual period has just ended, and her body is getting ready for ovulation. For most women, ovulation takes place about 11 – 21 days from the first day of the last period. During intercourse, several hundred million sperm are released in the vagina. Sperm will travel through the cervix and into the fallopian tube. If conception takes place, the sperm penetrates an egg and creates a single set of 46 chromosomes called a zygote, which is the basis for a new human being. The fertilized egg spends a couple days traveling through the fallopian tube toward the uterus, dividing into cells; it is called a morula. The morula becomes a blastocyst and will eventually end up in the uterus. Anywhere from day 6-12 after conception, the blastocyst will imbed into the uterine lining and begin the embryonic stage.

Gestational Age – Week 3 (Fetal Development – Week 1)
The embryo is going through lots of basic growth at this time, with the beginning development of the brain, spinal cord, heart, and gastrointestinal tract.

Gestational Age – Week 4 and 5 (Fetal Development – Week 2 and 3)
Arm and leg buds are visible, but not clearly distinguishable. The heart is now beating at a steady rhythm. The placenta has begun to form and is producing some important hormones including hCG. There is movement of rudimentary blood through the main vessels. The early structures that will become the eyes and ears are forming. The embryo is ¼ inch long by the end of these weeks.
**Gestational Age – Week 6 (Fetal Development – Week 4)**
The formation of the lungs, jaw, nose, and palate begin now. The hand and feet buds have webbed structures that will become the fingers and toes. The brain is continuing to form into its complex parts. A vaginal ultrasound could possibly detect an audible heartbeat at this time. The embryo is about a ½ inch in length.

**Gestational Age – Week 7 (Fetal Development – Week 5)**
At 7 weeks gestation, every essential organ has begun to form in the embryo’s tiny body even though it still weighs less than an aspirin. The hair and nipple follicles are forming, and the eyelids and tongue have begun formation. The elbows and toes are more visible as the trunk begins to straighten out.

**Gestational Age – Week 8 (Fetal Development – Week 6)**
The ears are continuing to form externally and internally. Everything that is present in an adult human is now present in the small embryo. The bones are beginning to form, and the muscles can contract. The facial features continue to mature, and the eyelids are now more developed. The embryo is at the end of the embryonic period and begins the fetal period. The embryo is about 1 inch long and is the size of a bean.

**Gestational Age – Weeks 9-13 (Fetal Development – Weeks 7-11)**
The fetus has grown to about 3 inches in length and weighs about an ounce. The genitalia have clearly formed into male or female, but still could not be seen clearly on an ultrasound. The eyelids close and will not reopen until the 28th week of pregnancy. The fetus can make a fist, and the buds for baby teeth appear. The head is nearly half the size of the entire fetus.
Second Trimester Development

Gestational Age – Weeks 14-16 (Fetal Development – Weeks 12-14)
The fetus’s skin is transparent and a fine hair called lanugo begins to form on the head. The fetus begins sucking and swallows bits of amniotic fluid. Fingerprints which individualize each human being have now developed on the tiny fingers of the fetus. Meconium is made in the intestinal tract and will build up to be the baby’s first bowel movement. Flutters may be felt in the mom’s growing abdomen as the fetus begins to move around more. Sweat glands have developed, and the liver and pancreas produce fluid secretions. The fetus has reached 6 inches in length and weighs about 4 ounces.

Gestational Age – Weeks 17-20 (Fetal Age – Weeks 15-18)
The baby has reached a point where movements are being felt more often by the mom. The eyebrows and eyelashes grow in, and tiny nails have begun to grow on the fingers and toes. The skin of the fetus is going through many changes and begins to produce vernix at the twentieth week. Vernix is a white pasty substance that covers the fetus’s skin to protect it from amniotic fluid. A fetal heartbeat could be heard by a stethoscope now. The fetus has reached a length of 8 inches and weighs about 12 ounces.

Gestational Age – Weeks 21-23 (Fetal Age – Weeks 19-21)
Lanugo now covers the fetus’s entire body. The fetus is beginning to have the look of a newborn infant as the skin becomes less transparent while fat begins to develop. All the components of the eyes are developed. The liver and pancreas are working hard to develop completely. The fetus has reached about 10-11 inches in length and weighs about 1 – 1 ¼ pounds.

Gestational Age – Weeks 24-26 (Fetal Age – Weeks 22-24)
If a baby was delivered now, it could survive with the assistance of medical technology. The fetus has developed sleeping and waking cycles and mom will begin to notice when each of these takes place. The fetus has a startle reflex, and the air sacs in the lungs have begun formation. The brain will be developing rapidly over the next few weeks. The nervous system has developed enough to control some functions. The fetus has reached about 14 inches in length and weighs about 2 ¼ pounds.
Third Trimester Development

**Gestational Age – Weeks 27-32 (Fetal Age – Weeks 25-30)**
The fetus really fills out over these next few weeks, storing fat on the body, reaching about 15-17 inches long and weighing about 4-4 ½ lbs by the 32nd week. The lungs are not fully mature yet, but some rhythmic breathing movements are occurring. The bones are fully developed but are still soft and pliable. The fetus is storing its own calcium, iron and phosphorus. The eyelids open after being closed since the end of the first trimester.

**Gestational Age – Weeks 33-36 (Fetal Age – Weeks 31-34)**
This is about the time that the fetus will descend into the head down position preparing for birth. The fetus is beginning to gain weight more rapidly. The lanugo hair will disappear from the skin, and it is becoming less red and wrinkled. The fetus is now 16-19 inches and weighs anywhere from 5 ¾ lbs to 6 ¾ lbs.

**Gestational Age – Weeks 37-40 (Fetal Age – Weeks 35-38)**
At 38 weeks the fetus is considered full term and will be ready to make its appearance at any time. Mom may notice a decline in fetal movement as the fetus is now filling the uterus with little room to move. The fingernails have grown long and will need to be cut soon after birth. Small breast buds are present on both sexes. The mother is supplying the fetus with antibodies that will help protect against disease. All organs are developed, with the lungs maturing all the way until the day of delivery. The fetus is about 19 – 21 inches in length and weighs anywhere from 6 ¾ lbs to 10 lbs.
# Fetal Movement

<table>
<thead>
<tr>
<th>Movement Type</th>
<th>Gestational Week of First Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any movement</td>
<td>7</td>
</tr>
<tr>
<td>Startle</td>
<td>8</td>
</tr>
<tr>
<td>Generalized movements</td>
<td>8</td>
</tr>
<tr>
<td>Isolated arm movements</td>
<td>9</td>
</tr>
<tr>
<td>Hand-face contact</td>
<td>10</td>
</tr>
<tr>
<td>Breathing</td>
<td>10</td>
</tr>
<tr>
<td>Jaw opening</td>
<td>10</td>
</tr>
<tr>
<td>Stretching</td>
<td>10</td>
</tr>
<tr>
<td>Yawn</td>
<td>11</td>
</tr>
<tr>
<td>Suck and swallow</td>
<td>12</td>
</tr>
</tbody>
</table>
Pregnancy Discomforts

There are many common discomforts during pregnancy. It’s important to know when these are just normal discomforts and when your student may need to see their doctor.

Swelling During Pregnancy
Slight swelling is expected during pregnancy; however, if someone experiences sudden swelling in the hands and face, it could be a sign of preeclampsia. It is important for women to contact their health care provider about any sudden swelling.

Swelling may be reduced by eating foods that are high in potassium, such as bananas, and by avoiding caffeine. Here are some other helpful hints to manage swelling during your pregnancy:
• Avoid standing for long periods, and rest with your feet elevated
• Minimize outdoor time when it is hot
• Wear comfortable shoes, avoiding high heels if possible
• Drink water, which helps flush the body and reduce water retention
• Practice yoga
• Minimize sodium (salt) intake and avoid adding additional salt to meals

Sleeping Problems During Pregnancy
During pregnancy many women find themselves wrestling in bed trying to get comfortable before falling asleep. Unfortunately, regular sleeping positions may no longer work for women during pregnancy. There are a number of reasons that cause this new discomfort, but there are some sleeping positions that women can try that may help them get much needed rest.

When a woman is pregnant her body goes through a variety of changes. These changes tend to disrupt your usual peaceful slumber. Reasons may include:
• Increased size of abdomen
• Back pain
• Heartburn
• Shortness of breath
• Insomnia
What are the best sleep positions during pregnancy?
The best sleep position during pregnancy is “SOS” (sleep on side). Even better is to sleep on the left side. Sleeping on your left side increases the amount of blood and nutrients that reach the placenta and the baby. It’s also helpful to keep the knees bent and a pillow between the legs.
During pregnancy, women should avoid sleeping on their backs: This can cause problems with backaches, breathing, digestive system, hemorrhoids, low blood pressure and decrease in circulation to the heart and the baby. This is a result of your abdomen resting on your intestines and major blood vessels (the aorta and vena cava).
Pregnancy and Sciatic Nerve Pain
The sciatic nerve is the largest nerve in the body, providing sensory and motor function to the lower extremities. This nerve provides sensation to the back of the thigh, lower part of the leg and the sole of the foot. Sciatic nerve pain is a periodic severe pain that occurs throughout your legs.
What causes sciatic nerve pain during pregnancy?
The sciatic nerve runs under the uterus to the legs. The cause of sciatic nerve pain is thought to be associated with pressure on the nerve caused by the developing baby.

What can women do to treat sciatic nerve pain during pregnancy?
The simplest remedy is to lie on the side, opposite of the pain. This may help relieve the pressure on the nerve. Avoid heavy lifting and minimize standing for long periods of time. If a woman experiences pressure while standing, she can try elevating one foot and resting it on something. Yoga can also be helpful. Some women can get relief by applying heat or cold to the problem area. It is important for women to contact their health care provider if the pain becomes constant, or increases in severity or frequency.

Round Ligament Pain
Round ligament pain is most common during the second trimester. Women may have a sharp pain in their abdomen or hip area that is either on one side or both. Some women even report pain that extends into the groin area. Round ligament pain is considered a normal part of pregnancy as the body goes through many different changes.

The round ligament supports the uterus and stretches during pregnancy. It connects the front portion of the uterus to the groin. These ligaments contract and relax like muscles, but much more slowly. Any movement (including going from a sitting position to standing position quickly, laughing, or coughing) that stretches these ligaments, by making the ligaments contract quickly, can cause a woman to experience pain. Round ligament pain should only last for a few seconds.

Rest is one of the best ways to help with this kind of pain. Changing positions slowly (as in a restorative yoga practice) allows the ligaments to stretch more gradually and can help alleviate any pain. If a woman knows that she going to sneeze, cough, or laugh, she can bend and flex her hips, which can reduce the pull on the ligaments. If a woman is having consistent round ligament pain, stretching and yoga may be helpful. Frog posture can be useful.

If the pain persists after resting, or it is accompanied by severe pain, a woman should notify her health care provider. If the pain lasts for more than a few minutes she should contact her health care provider immediately. A woman
would also want to notify her health care provider if the pain is accompanied by any bleeding, cramping, fever, chills, nausea, vomiting, or change in vaginal discharge.

**Leg Cramps**

It is not uncommon to experience leg cramps during pregnancy, particularly in the third trimester. According to research, almost half of all pregnant women suffer from muscle spasms in their legs, with cramping more frequent during the evening.

What causes leg cramps during pregnancy? Leg cramps may be caused by the additional weight gain of pregnancy and changes in circulation. Pressure from the growing baby may also be placed on the nerves and blood vessels that go to the legs. This pressure or pinching may be the cause of leg cramps.

There are a few things that women can do to treat leg cramps or prevent them from occurring. Suggest that your students try one or more of the following interventions to help relieve or prevent your leg cramps:

- Exercise regularly; include yoga postures that stretch the calves
- Rest with the legs elevated
- Wear supportive stockings
- Massage the calves and feet
- Apply local heat

Encourage students to contact their health care provider if leg cramps are severe or remain consistent.

**Pregnancy and Heartburn**

Heartburn is a common complaint during pregnancy. Although it has nothing to do with the heart, heartburn involves a burning sensation in the center of the chest.

What causes heartburn during pregnancy? Heartburn occurs when the valve between the stomach and the food pipe (esophagus) are unable to prevent the stomach acids from passing back into the esophagus. Pregnancy can increase the frequency of heartburn because the hormone progesterone causes the valve to relax. This allows the stomach acid to pass into the esophagus and irritate the lining.

Heartburn and indigestion are more common during the third trimester because the growing uterus puts pressure on the intestines and the stomach. The pressure on the stomach may also push contents back up into the esophagus. What can you do to treat heartburn during pregnancy?

Preventing heartburn is the best way to deal with it! Here are some helpful hints
to avoid heartburn:
• Eat five to six smaller meals throughout the day rather than three large meals
• Wait an hour after eating to lie down
• Avoid spicy, greasy and fatty foods
For those who are experiencing heartburn, they can:
• Eat yogurt or drink a glass of milk
• Try a tablespoon of honey in a glass of warm milk

Remind students not to take over-the-counter antacids without speaking to their health care provider. Some antacids contain high levels of sodium, which can cause fluid buildup in body tissues. Some may also contain lead.
If heartburn symptoms are severe, a woman should check with her health care provider.

Headaches During Pregnancy

Experiencing headaches during pregnancy is one of the most common discomforts and complaints. Headaches may occur at any time during pregnancy, but they tend to be most common during the first and third trimesters.

What causes headaches during pregnancy?
An increase in headaches during the first trimester is believed to be caused by the surge of hormones along with an increase in the blood volume circulating throughout the body. These headaches may be further aggravated by stress, poor posture or changes in vision.

Other causes of headaches during pregnancy may involve one or more of the following:
• Lack of sleep
• Low blood sugar
• Dehydration
• Caffeine withdrawal
• Stress (too many changes)

Women who have regular migraine headaches may discover that they experience fewer migraines during pregnancy; however, some women may encounter the same number or even more migraine headaches. It is important for woman to talk to their health care provider about any medications that they may be taking for headaches.

Headaches during the third trimester tend to be related more to poor posture and tension from carrying extra weight. Headaches during the third trimester may also be caused by a condition called preeclampsia, which is high blood pressure during pregnancy.
The best way to deal with headaches is to avoid them altogether. Avoiding tension headaches is easiest when you follow these tips:

- Practice good posture (especially during the third trimester)
- Get plenty of rest and relaxation
- Exercise and yoga practice
- Eat well-balanced meals
- Apply cold or heat packs to your head

During pregnancy, it’s best for women to try and relieve headache by natural means if possible. Pain relief medications such as aspirin and ibuprofen are not recommended in most pregnancies; however, acetaminophen may be recommended by a health care provider.

Some natural headache remedies include:

- For a sinus headache, apply a warm compress around the eyes and nose
- For a tension headache, apply a cold compress or ice pack at the base of your neck
- Maintain your blood sugar by eating smaller, more frequent meals. This may also help prevent future headaches
- Get a massage. Massaging your shoulders and neck is an effective way to relieve pain
- Rest in a dark room and practice deep breathing
- Take a warm shower or bath

Applying heat or cold to the sides of the head, the eyes, or along the back of the neck is one of the best ways to reduce or relieve the pain associated with a headache.

Women should contact their health care provider:

- Before taking any medications
- If they do not experience any relief from the remedies above
- The headaches get worse or more persistent
- They experience headaches that are different than normal
- The headaches are accompanied by: blurry vision, sudden weight gain, pain in the upper right abdomen, and swelling in the hands and face

**Back Pain During Pregnancy**

Back pain or discomfort is common during pregnancy and should be expected to some degree by most women. Back pain may be experienced during any point of your pregnancy; however, it most commonly occurs later in the pregnancy as the weight of the baby increases. Back pain can disrupt a woman’s daily routine or interfere with a good night of sleep.
How common is back pain during pregnancy?
The prevalence varies with reports, showing between 50 to 70 percent of all pregnant women having back pain.

What causes back pain during pregnancy?
Back pain during pregnancy is related to a number of factors. Some women begin to experience lower back pain with the onset of pregnancy. Women who are most at risk for back pain are those who are overweight or had back pain prior to pregnancy. Here is a list of potential causes of back pain or discomfort during pregnancy:

• Increase of hormones – hormones released during pregnancy allow ligaments in the pelvic area to soften and the joints to become looser in preparation for the birthing process of your baby; this shift in joints and loosening of ligaments may affect the amount of back support a woman experiences
• Center of gravity – center of gravity will gradually move forward as the uterus and baby grow, which causes posture to change
• Additional weight – the developing pregnancy and baby create additional weight that the back must support
• Posture or position – poor posture, excessive standing, and bending over can trigger or escalate the pain experienced in your back
• Stress – stress usually finds the weak spot in the body, and because of the changes in the pelvic area, there may be an increase in back pain during stressful periods of pregnancy

Back pain may not be prevented completely, but the severity or frequency can be reduced. Here are a few steps your students can take to reduce back pain:

• Use exercises approved by your health care provider that support and help strengthen the back and abdomen, such as yoga
• Squat to pick up something versus bending over
• Avoid high heels and other shoes that do not provide adequate support
• Wear a support belt under the lower abdomen
• Get plenty of rest. Elevating the feet is also good for the back
• Yoga can also help students become more aware of their posture and maintain proper posture even as their center of gravity shifts.

Experiencing back pain itself is usually not a reason to contact a health care provider, but there are situations where contacting a provider is necessary. Your students will want to contact their health care provider if they are experiencing any of the following:

• Severe back pain
• Increasingly severe or abrupt-onset of back pain
• Rhythmic cramping pains; this could be a sign of preterm labor
Pregnancy and Dizziness

Dizziness or feeling faint is a normal symptom during pregnancy. It is more common in the first trimester, but it may also be prevalent throughout your pregnancy.

What causes dizziness during pregnancy?
The main cause of dizziness in pregnancy is due to the rising hormones that cause blood vessels to relax and widen. This helps increase the blood flow to the baby, but it slows the return of the blood in the veins. This causes blood pressure to be lower than usual, which can reduce the blood flow to the brain, temporarily causing dizziness.

Dizziness is also caused by low blood sugar levels that may occur as a woman’s body adapts to changes in metabolism. Women who are anemic or who have varicose veins may be more susceptible to dizziness than others.

During the second trimester, dizziness may be caused because the growing uterus puts pressure on blood vessels. Dizziness may also occur later in pregnancy if a woman lies on her back, allowing the weight of the baby to press on the vena cava (a large vein that carries blood from your lower body to your heart).

There are a number of ways to reduce dizziness, such as
• Avoid standing for long periods.
• Get up slowly from either sitting or lying down
• Eat regularly. Avoid long periods between meals; it is better to snack throughout the day
• Avoid hot baths or showers
• Avoid lying on your back once you reach the middle of your second trimester
• Wear loose, comfortable clothing to avoid restricting circulation

If a student feels faint in your class, have them:
sit or lie down with their head lowered
take deep breaths
loosen any tight clothing
open windows and move towards circulating air
eat something, preferably eat foods rich in iron

Women should contact their health care provider immediately if dizziness is accompanied by vaginal bleeding and/or pain in your abdomen. This could be a sign of an ectopic pregnancy, a low-lying placenta, or placental abruption. Medical help should also be sought for persistent dizziness or dizziness accompanied by blurred vision, headaches, or palpitations; this may be a symptom of severe anemia or some other illness that could have a negative effect on pregnancy.
Common occurrences in first trimester of pregnancy
- Morning sickness
- Sensitive or sore breasts
- Frequent urination
- Constipation
- Fluctuating emotions
- Nausea and vomiting peak during the first trimester, with 50-70 percent of pregnant women experiencing at least some nausea.

Common occurrences in the second trimester of pregnancy
- Frequent urination
- Insomnia
- Indigestion
- Muscle cramping
- Pains associated with stretching uterus
- Vaginal discharge

Common occurrences in the third trimester of pregnancy
- Breathlessness due to pressure on the diaphragm
- 10 percent of pregnant women at this stage experience mild depression
- Edema (swelling caused by fluid in the body’s tissues) – usually occurring in the feet, ankles and legs