

A Month at a Time
From Conception to Birth

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Introduction/ Summary:

The duration of pregnancy is divided into three equal segments called trimesters. The first trimester (months 1-3) is essential to the proper development of the infant and encompasses both the zygote and embryonic periods of prenatal development. All organs, nerve cells and brain cells develop.

During this trimester (1st) is when most spontaneous abortions (miscarriages) occur. They generally are caused by abnormal development of the fetus and are nature's way of eliminating a chromosomal abnormality. It is vital that all necessary nutrients be available to the fetus in order to develop properly.

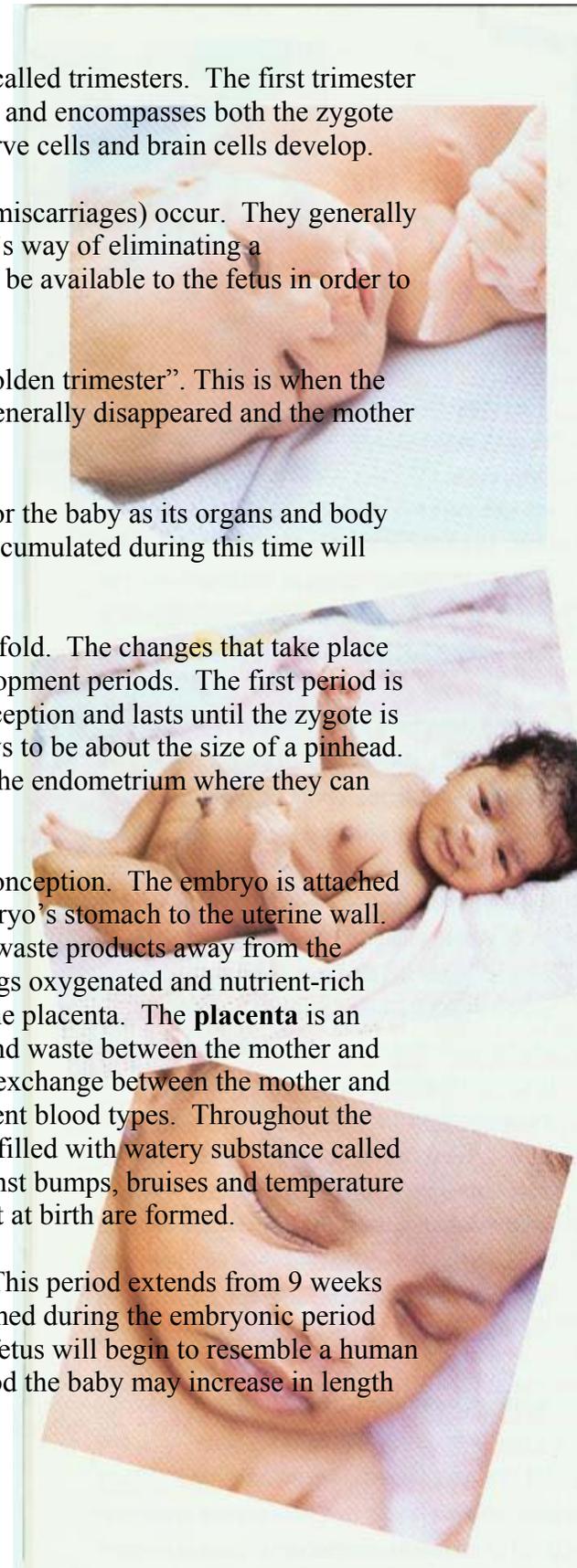
The second trimester (months 4-6) is often referred to as the "Golden trimester". This is when the mother generally feels the best. Morning sickness and nausea generally disappeared and the mother is quite comfortable.

The third trimester (months 7-9). These are important months for the baby as its organs and body systems mature and prepare to function on their own. The fat accumulated during this time will give the baby a "head start" on life.

With conception, the story of prenatal development begins to unfold. The changes that take place during the 40 weeks of pregnancy are separated into three development periods. The first period is referred to as the period of the **zygote**. This stage begins at conception and lasts until the zygote is implanted in the mother's uterus (10-14 days). The zygote grows to be about the size of a pinhead. Implantation takes place when roots grow from the zygote into the endometrium where they can receive nutrients from the mother's blood.

The period of the **embryo** lasts from 2 weeks to 8 weeks after conception. The embryo is attached to the mother by the umbilical cord which reaches from the embryo's stomach to the uterine wall. The **umbilical cord** contains arteries which carry the embryo's waste products away from the embryo to the mother's blood system to be purified. It also brings oxygenated and nutrient-rich blood back to the embryo. The umbilical cord is connected to the **placenta**. The **placenta** is an organ which serves as a medium for the exchange of nutrients and waste between the mother and the fetus. It is important to note, that there is no blood to blood exchange between the mother and the embryo, which allows embryo and mother to have independent blood types. Throughout the embryonic period, the embryo is inside the **amniotic sac** (a bag filled with watery substance called amniotic fluid). The fluid will protect the developing baby against bumps, bruises and temperature changes. During this period all of the organs that will be present at birth are formed.

The third development period is called the period of the **fetus**. This period extends from 9 weeks until birth. The body parts, organs and systems which were formed during the embryonic period will become much more developed and begin to function. The fetus will begin to resemble a human being and features will increase in clarity. During the fetal period the baby may increase in length as much as twelve inches.

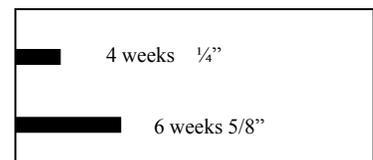
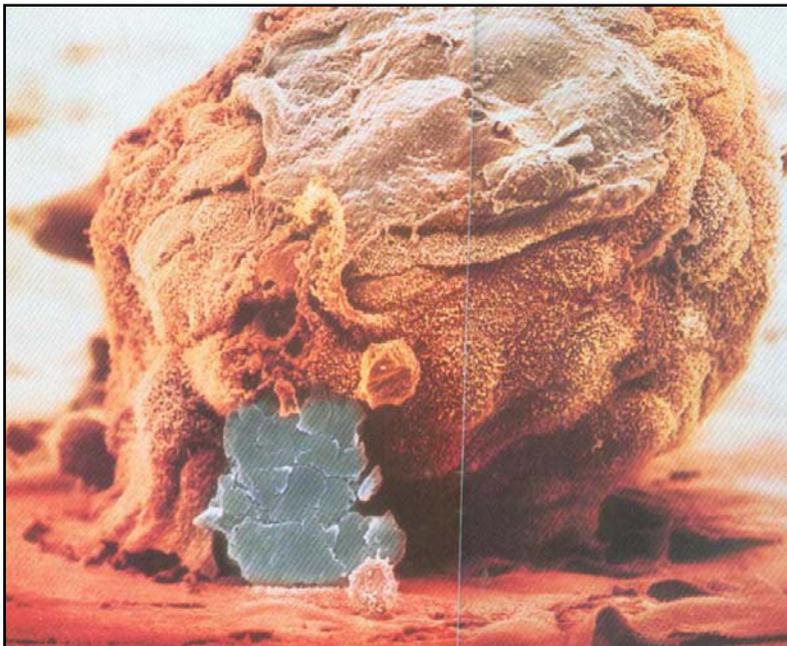


BABIES MONTHLY DEVELOPMENT



A sperm penetrating the egg's protective membrane (*left and center*), then sheds its tail) (*right*).

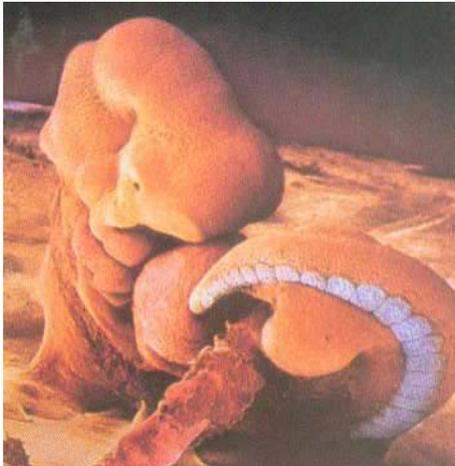
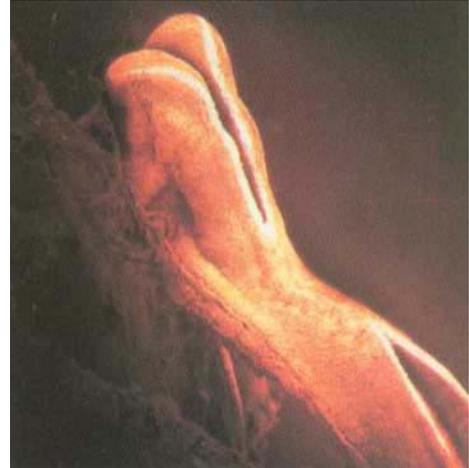
Month 1-After conception takes place, this single fertilized egg divides: into two identical cells, then four, then eight, then 16 and so on, and so on. The zygote—now a ball of cells still too small to be seen—is floating free inside the uterus. About one week after conception, (or three weeks after the start of the last menstrual period) the ball of cells nestles into the well-prepared endometrium—an event called implantation. Some of the cells will grow into the placenta; others will become part of the baby. With implantation, blood levels of the hormone progesterone rise in the mother instead of fall.



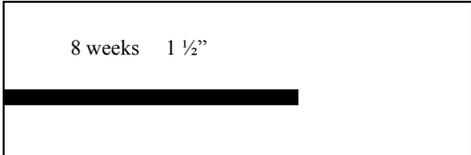
During the first trimester many changes take place for the baby. At four weeks the embryo is approximately $\frac{1}{4}$ inch long and its heart has started to beat. By six weeks after fertilization the embryo is about $\frac{5}{8}$ inch long and has developed most of its vital organs.

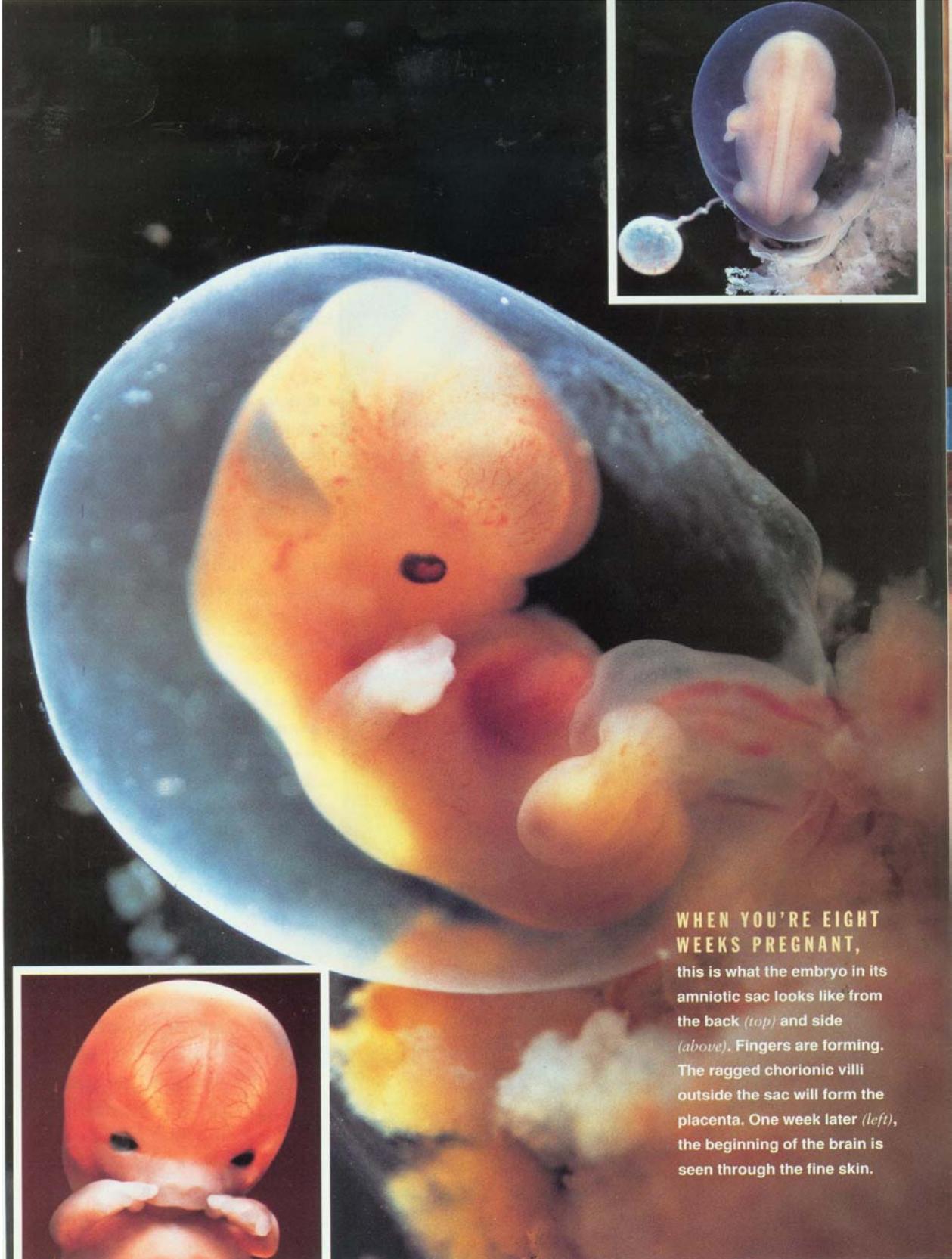
Month 2 – The embryo increases in length to about 1 ½ inches. Bones and muscles begin to form. The head grows rapidly at first, accounting for about half of the embryo’s size. The face and neck begin to take on human form. The brain develops with greater speed than any other organ. Leg and arm buds form and grow the eyes begin converging toward the center of the face. The mouth and nose form. Major organs of the digestive system become differentiated. The heart has been beating for about a month now.

In the fifth week, the two ends of the long strip of cells that are the embryo fold in gently. One fold will become the head. Nerves that will become the brain have started to form. The fold at the other end of the embryo will become the part that wears diapers. Between these two folds are growing the neural tube (the site of the spinal cord) and a hint of the bones of the spine that protect the cord.



The baby’s bones are still soft but the skeleton is well-formed. The arms and legs are forming. At eight weeks the embryo officially becomes a fetus.

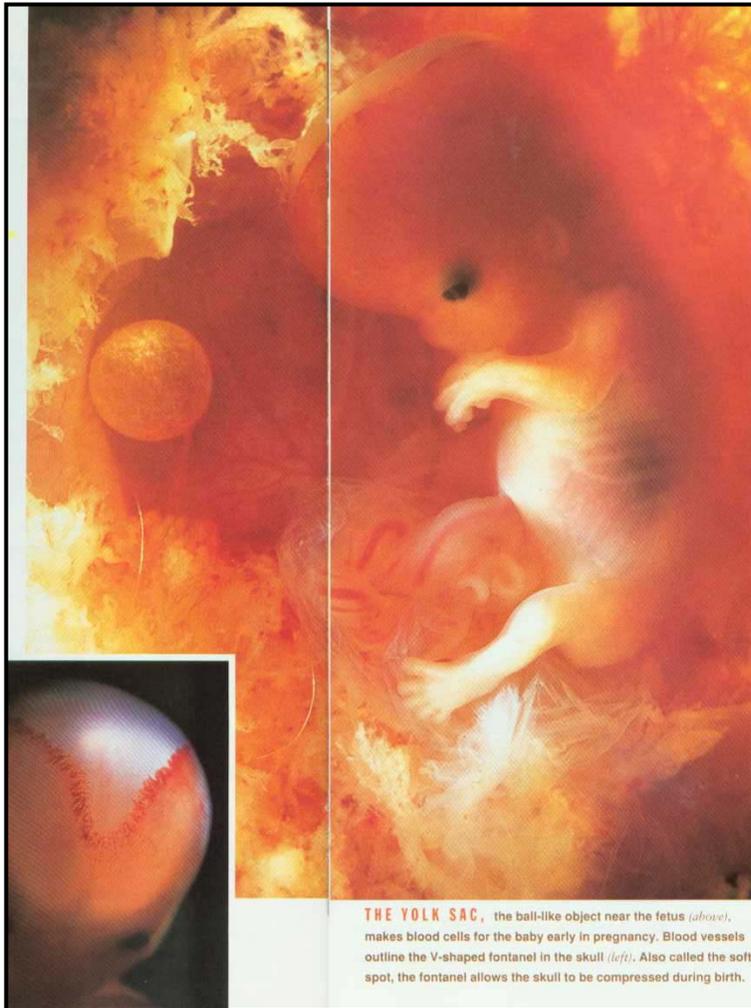




WHEN YOU'RE EIGHT WEEKS PREGNANT,

this is what the embryo in its amniotic sac looks like from the back (*top*) and side (*above*). Fingers are forming.

The ragged chorionic villi outside the sac will form the placenta. One week later (*left*), the beginning of the brain is seen through the fine skin.



By the ninth week the fetus floats in the amniotic fluid and is nourished from the placenta through the umbilical cord.

Month 3 – The fetus measures about 3 inches from head to buttocks and weighs about ½ ounce. The fetus has all of its major systems and they are functioning. However, it is still unable to survive independently. No new organs will need to be formed, but the ones that are present will need time to develop and mature. The digestive system is active. The liver and kidneys are functioning. The fetus practices swallowing amniotic fluid, breathing amniotic fluid and its vocal chords are developing. The roof of its mouth comes together and fuses. Taste buds appear, sex organs continue to develop, buds for all temporary teeth are formed and bone formation begins. During this month, arms, legs and fingers begin to make spontaneous movement. The eyelids close and are sealed shut. They will reopen again in the womb at about 6 months.

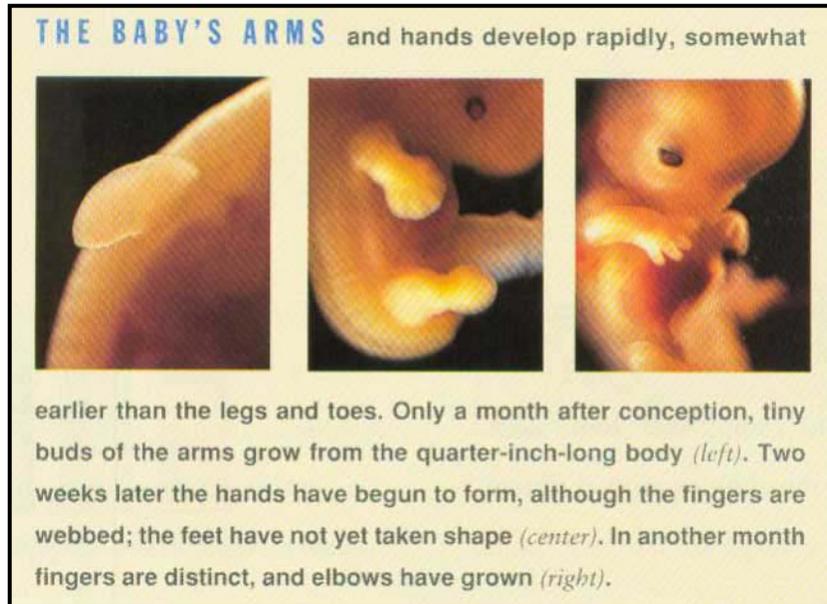
12 weeks 3"



THE EAR takes several months to assume its familiar appearance.

The internal parts of the ear form in the first two months. By ten weeks of pregnancy (*left*), the future outer ear is visible. The ear is still forming at four months (*center*) and is finished a month later (*right*). Singing to an unborn baby is fun for parents, but no one has shown whether it influences the baby's development after birth.

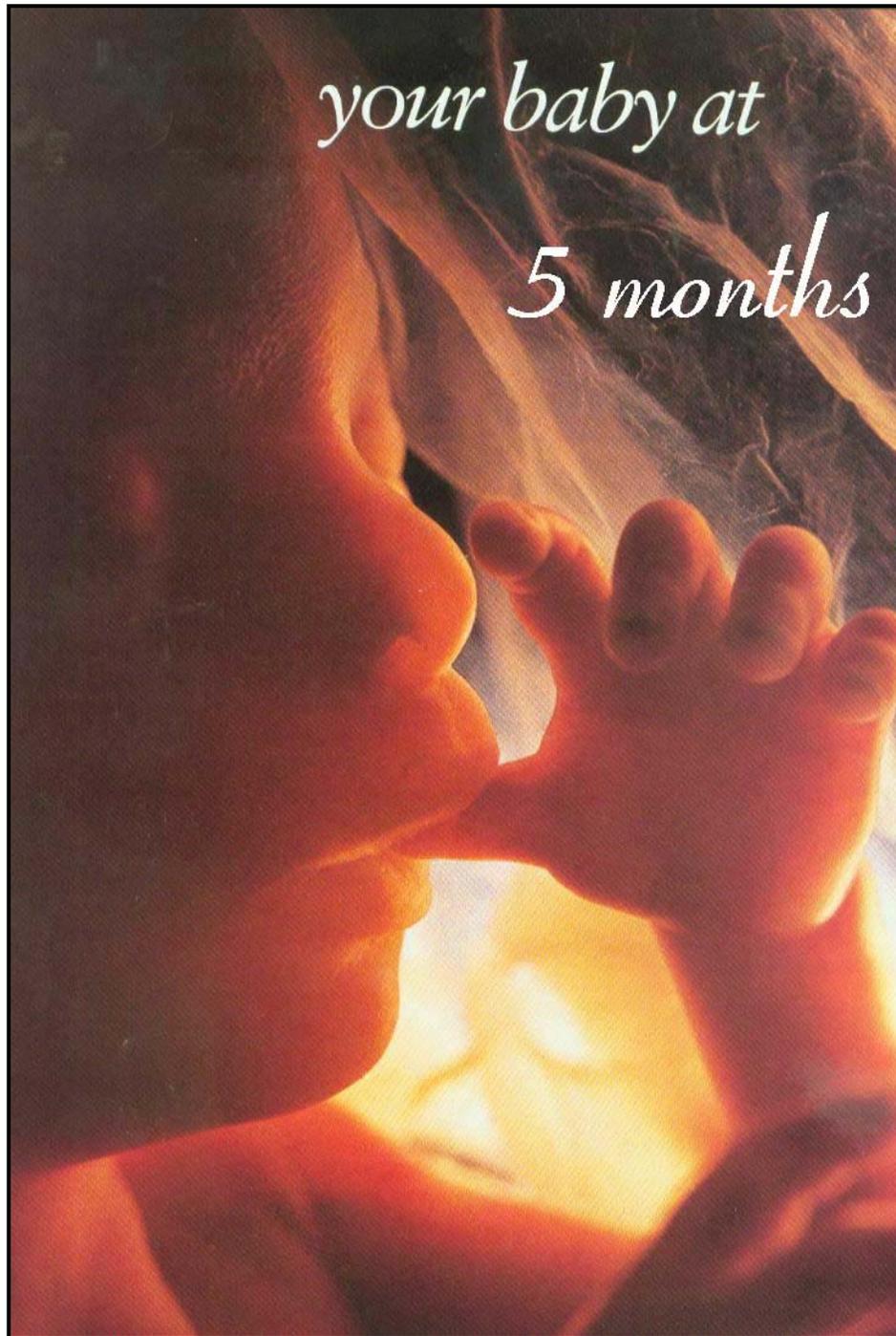
Month 4 – The fetus grows to almost 5 inches in length and 4 ounces in weight. The skin is thin, loose and wrinkled and appears red because of underlying blood vessels. The face acquires a human appearance. The body outgrows the head at this time. Hands and feet become well formed and finger closure is possible. The fetal reflexes become more brisk as it begins to stir and move the arms and legs. In males, the testes are in position for later descent into the scrotum and in females, the uterus and vagina are recognizable.



The eyelids are closed this month and stay closed until the end of the trimester. As the fetus grows, the body has proportions more like a baby's, especially near the end of the fourth month.

16 weeks 5"

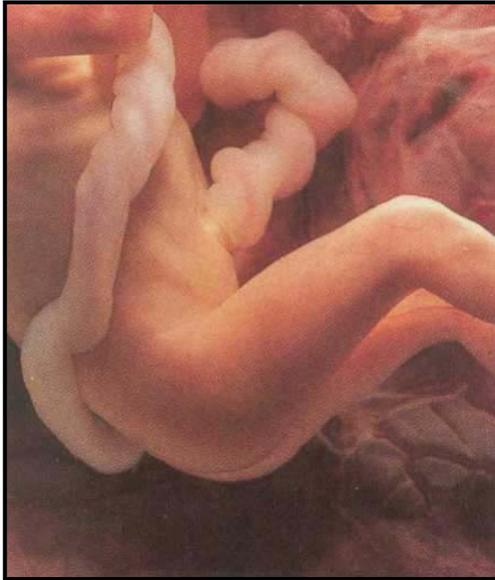




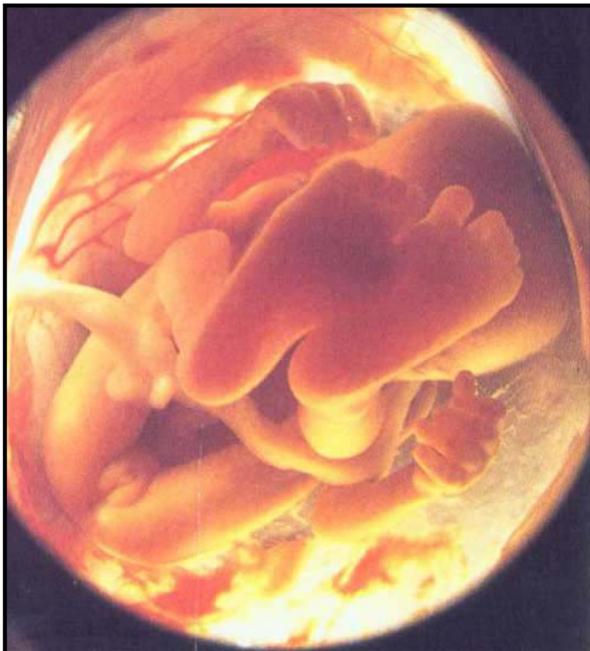
20 weeks 6-7"

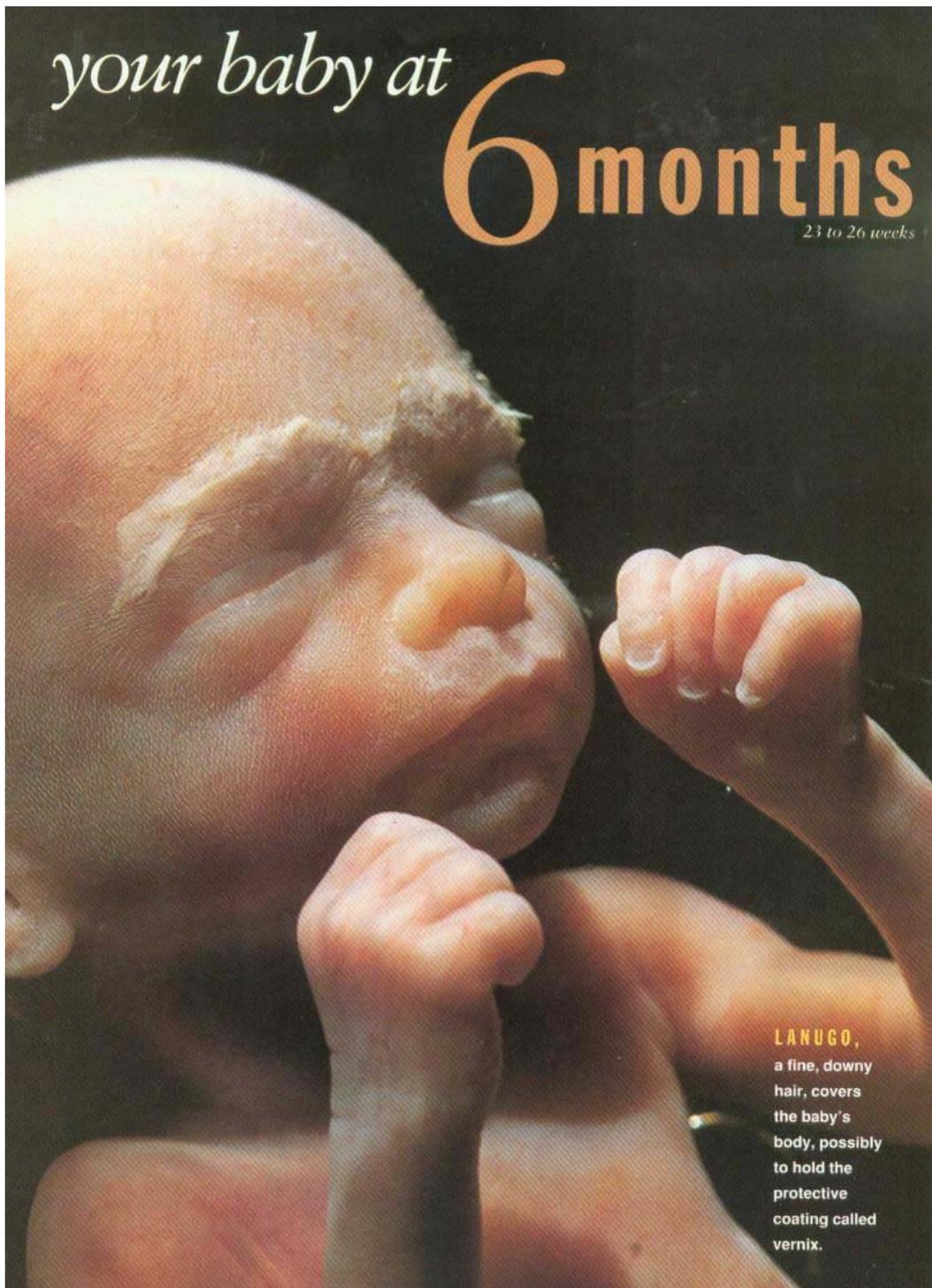
Month 5 – The fetus is now about 6-7 inches long and weighs about 10-12 ounces. During this month the mother will probably feel the baby’s movement, called **quickening**. It is suspended in a quart of amniotic fluid. The development seems advanced but the skin and digestive organs are not prepared to exist outside the womb and there is no provision for regulating body temperature.

The fetus grows a fine dark body hair called **lanugo** and collects **vernix**, a waxy coating to cover and protect the skin. The nose and ears begin ossification, the skeleton hardens, and the heartbeat can now be heard. Fingernails and toenails begin to appear and the baby will wake and sleep regularly. Sweat glands are formed and functioning.



Limbs, Muscles, and Nerves are stronger and more coordinated, and the fetus turns, stretches, and kicks, movements the mother cannot doubt that she feels. It may be as long as a month, however, before the baby's father will be able to feel the movements by touching the mother's stomach.



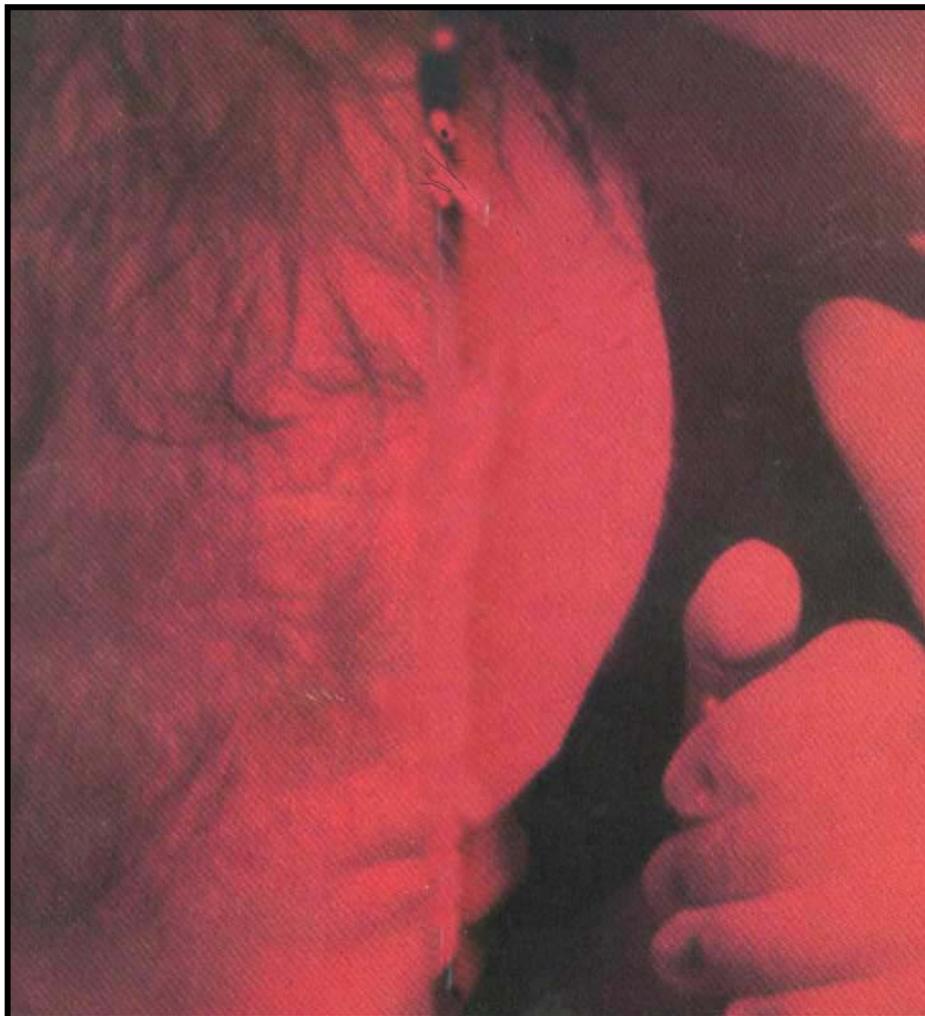


6 months 9"

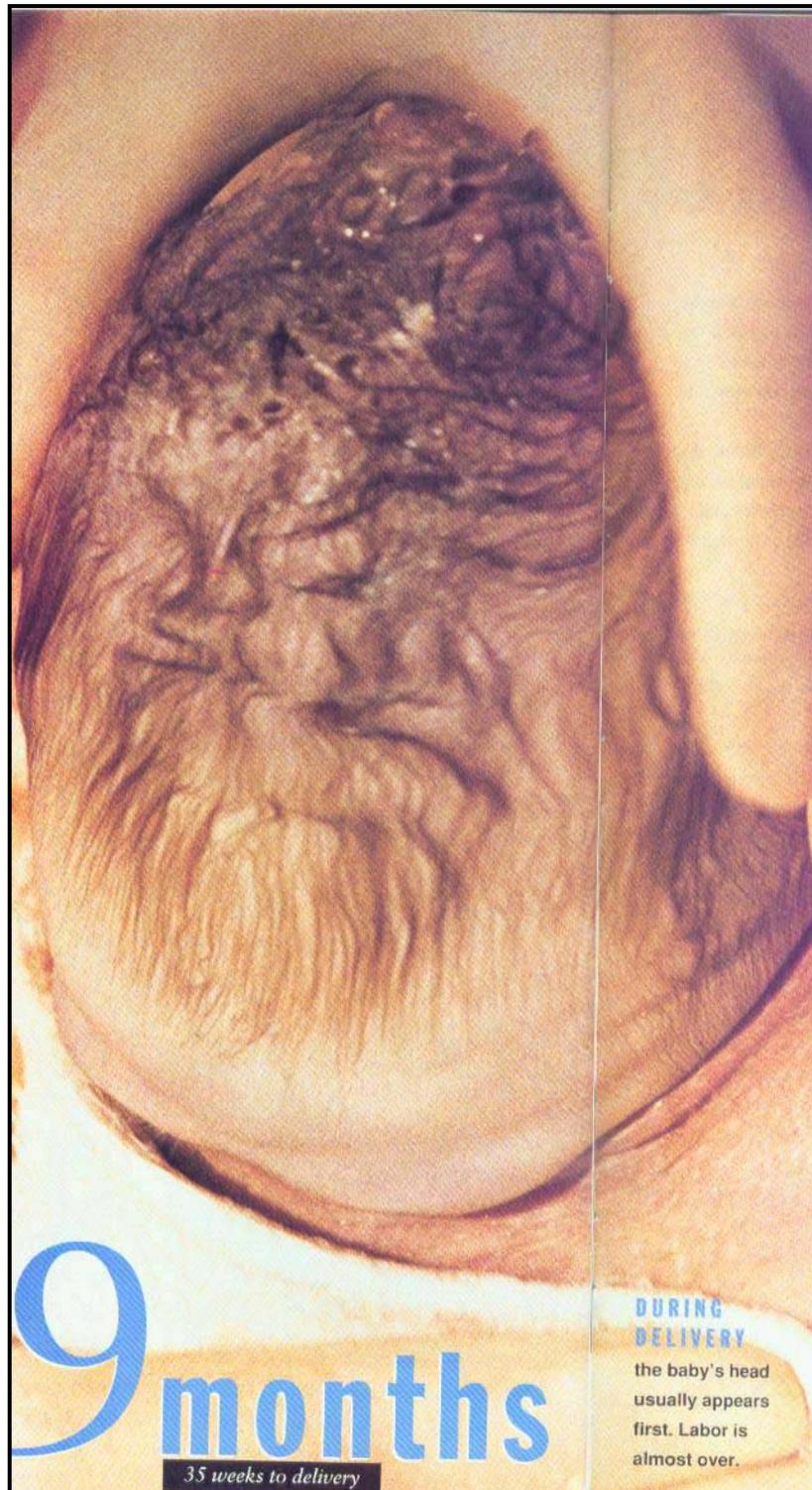
Month 6 – The fetus increases in weight and is now between 1 ½ - 2 pounds, and nine inches long. The eyelids, which have been fused shut, are now open and completely formed. The eyes look up, down and sideways. Eyebrows and eyelashes are well defined and taste buds appear on the tongue and in the mouth. There is significant evidence that the baby can hear the outside world. The sounds are probably muffled, like sounds under water. The baby can hear the mother’s voice and heart beat and, of course, the rumbling of her stomach. Fingerprints are formed.

Month 7 – The fetus is now about 10-12 inches long and weighs between 2 ½ - 3 pounds. It can cry weakly and can suck its thumb. The fetus can make a variety of reflex movements: startle, grasp, and swim movements. The cerebral hemispheres cover almost the entire brain.

Month 8 – The fetus will gain 2-3 pounds during this month, which it will need to stay warm following birth. The fetus will measure about 12 inches from the head to the buttocks. The fingernails reach beyond the fingertips and much of the lanugo is shed. By the end of this month, the fetus will most likely settle into the head down position. However, the baby is capable of changing positions.



Month 9 – The fetus reaches full growth. It measures 14-15 inches from head to buttocks and weighs 6-8 pounds. During this last month, the baby acquires antibodies from its mother which will give it temporary immunity against some diseases. The eyes are normally blue at birth because pigmentation is not normally formed until after a few weeks of exposure to light. Vernix is present over the entire body. The fetus will alternate between periods of activity and periods of quiet. The organs increase their activity, the fetal heart rate increases to a rapid rate. Birth usually occurs approximately 40 weeks (280 days) after the first day of the mother's last menstrual period.



TRIMESTERS

FIRST TRIMESTER

Before becoming pregnant it is wise to visit with your doctor and determine what **prenatal vitamins** should be taken to aide in developing a healthy baby. A healthy diet including the recommended servings from the food guide pyramid, and eating plenty of leafy greens (*which helps ensure adequate amounts of **folic acid** in the body*) should be eaten on daily basis before becoming pregnant.

There are many signs and symptoms that help determine pregnancy.

The first and most obvious change is missing a menstrual period. Usually, with this symptom, a woman will suspect pregnancy, although some women may miss two periods (if their cycle is not regular) before suspecting pregnancy. Upon missing a menstrual period, the woman should contact her doctor for an appointment. A simple urine test from the doctor will show whether or not a woman is pregnant.

Home pregnancy tests are available for a minimal cost and are quite accurate, but are no substitute for a doctor's test or visit. (Most doctors require their own test to confirm pregnancy.)

Prenatal care under the direction of a doctor is highly recommended. The doctor will track the mother's general health, weight gain, and the capacity of her uterus and cervix to support the fetus. The fetus' growth is also carefully monitored allowing for appropriate intervention when needed.

Other changes that take place in the woman are as follow:

Morning sickness/nausea: this probably occurs due to the change in hormones or a drop in blood level. Morning sickness does not just take place in the morning. Many women say it is associated with smells or foods they eat. Not much can be done to cure morning sickness. (Drugs or over-the-counter stomach remedies should not be taken.) Watching your diet can help relieve some of the symptoms. Your doctor may recommend eating several small meals through out the day and/or eating something before getting out of bed, such as crackers. In some instances, a vitamin B6 shot can be given by the doctor to help alleviate nausea.

Frequent urination: Because the uterus lies next to the bladder, the changes in the uterus causes crowding. Therefore, the need for urination is increased.

Cravings: Food cravings are common during pregnancy. Giving in to them once in a while is all right. Pica is a condition were the woman craves unusual foods or substances (e.g. dirt, salt, rocks etc). If you crave non-food items, consult your doctor.

Breasts: Swollen, tender breasts are common in pregnancy. This may occur before the menstrual period is missed. The breasts will enlarge a lot during the first few months. Although nothing will prevent stretch marks, lotions can relieve the tightness and itching associated with pregnancy.

Fatigue and Dizziness: these are two common symptoms of early pregnancy. To alleviate dizzy spells, get up slowly. To help with fatigue, get plenty of rest and eliminate unnecessary physical exertion. However, maintaining a regular pre-pregnancy exercise program can be most beneficial as long as it is with your doctor's approval.

The doctor should be called immediately if any of the following symptoms occur:

1. Vaginal bleeding
2. Sharp abdominal pain or cramping
3. Loss of fluid from the vagina
4. Severe or prolonged nausea or vomiting
5. Frequent dizzy spells
6. Painful urination
7. High fever over 100°F
8. Vaginal discharge that is irritating

Other considerations:

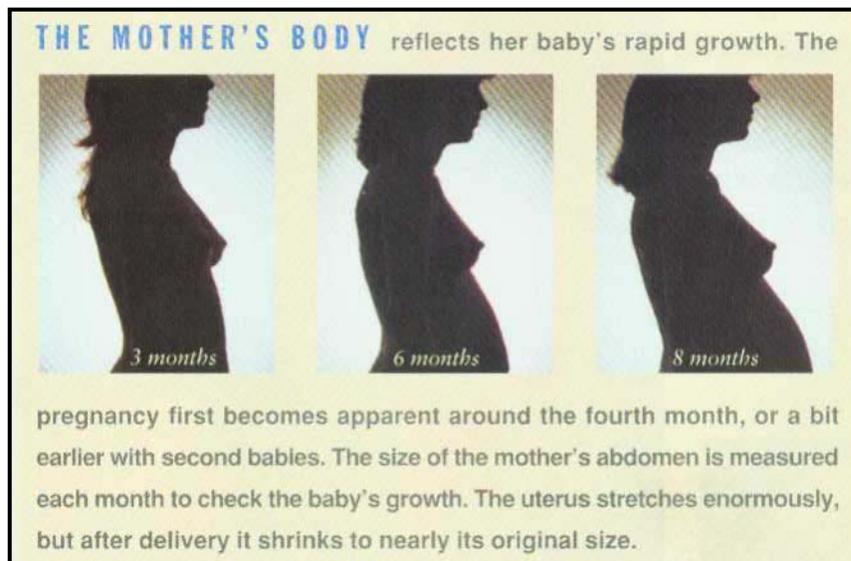
1. Do not take any medication unless approved by your doctor. This includes over-the-counter drugs.
2. No drugs or alcohol. These have a tremendous effect on the baby.
3. No X-rays. Radiation can interfere with cell division and organ development.
4. No saunas and hot tubs. The high and prolonged temperatures can be harmful to the fetus.
5. Vaccinations. Because vaccinations are live viruses, these should not be taken during pregnancy. However, do vaccinate the children in your home to protect them against these deadly diseases. Check with your doctor before becoming pregnant to ensure that ALL YOUR vaccinations are current.
6. Cats. A parasite found in cats, cattle, sheep, and or their feces can cause a disease in humans called Toxoplasmosis. This can cause severe damage to an unborn child. Because of this risk, you should avoid undercooked meat and changing cat litter boxes (*contact with feces*).

SECOND TRIMESTER

The woman's body has many changes taking place:

Skin: each woman's body reacts differently to pregnancy. Skin may become oily, dry, scaly, etc. The skin must stretch over the growing uterus; therefore, stretch marks appear often. Facial skin may darken. This is called Chloasma or the mask of pregnancy. Staying out of the sun can help but usually there is nothing that can be done to prevent it. It usually disappears after pregnancy. Another area that darkens is a line from the navel to the pubic hair. This line disappears after pregnancy.

Emotions: Because of the hormonal changes within the woman's body, she may experience mood swings, depression, and even bad dreams. She simply must adjust and realize that the moods will pass. She may need a few extra breaks or time to relax. She should not blame herself but realize that this is normal with all of the changes taking place in her body and life.



THIRD TRIMESTER

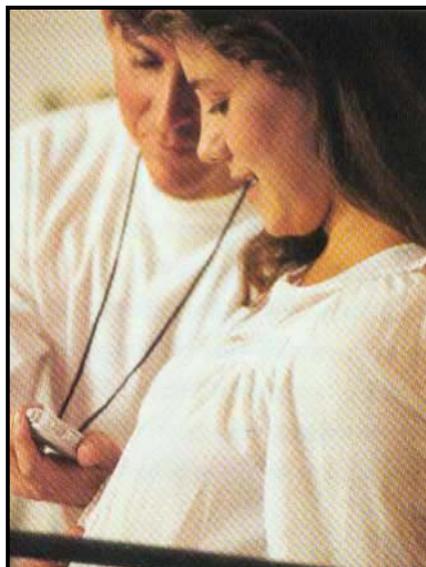
The most obvious change that takes place in the third trimester is the shape and condition of the woman's body. The abdomen enlarges and fatigue is common.

The baby moves a lot now. The mother should feel it move every couple of hours. If she does not, she should call her doctor. Generally expectant fathers take more interest during this last trimester. This is because they can feel the baby move and the reality of the impending birth makes them anxious and excited.

A lot of women become more interested in how their bodies function during pregnancy, especially with a first pregnancy. It is recommended the couple take classes and read to learn about pregnancy and delivery.

There are some common discomforts many women experience during the third trimester:

1. Heartburn is caused by the large size of the baby and the stomach being pushed up. Usually cutting down on the size of meals will help alleviate this problem. Eating several small meals is suggested and/or cutting out greasy, spicy foods. Again, CAUTION, do not take any over-the-counter medicines without your doctor's approval.
2. Shortness of breath is due to the size and activity of the baby. Taking deep breaths is a difficult task. Before delivery the baby "drops," making breathing easier.
3. Some women experience heart palpitations. The body volume has increased and sometimes the heart has to work overtime. However, the heart can stand the strain.
4. Leg cramps are common, especially late in the pregnancy. These are often called "Charley Horses." The woman must walk them off or relax until they subside. Providing the body with plenty of calcium is important.
5. Round ligament pains. Because of all the pressure on the ligaments in the lower abdomen, a mild to moderate pain sometimes occurs. A product called a SLING available at women's personal departments. This helps support the abdomen and back, relieving pain and discomfort.



DANGER SIGNALS

As in the other trimesters, there are danger signals to watch for:

- **Toxemia (eclampsia)**—high blood pressure
- **Gestational Diabetes**
- Vaginal bleeding
- Sharp abdominal pain/cramping
- Loss of fluid
- Frequent dizzy spells
- Visual disturbances
- Nausea or vomiting
- Sudden and excessive swelling of face, hands, and feet
- Headache
- Burning, painful urination
- Fever
- Vaginal discharge



Call your doctor if any of these problems occur.

The recommended weight gain for an average woman during pregnancy is 25 to 30 pounds.

Generally weight is distributed as follows:

Baby – 7 ½ pounds

Placenta – 1 ½ pounds

Uterus – 2 pounds

Amniotic Fluid – 1 ½ pounds

Extra blood volume and water retention – 4 ½ pounds

Breast tissue – 3 pounds

Maternal stores of protein – 4 pounds

