

TRAIN FOR SUCCESS INC.  
OBSTETRICS/GYN 14Hr

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PREPARED BY MICHELLE BROOMFIELD RN

# TRAIN FOR SUCCESS INC.

## OBSTETRICS/GYN 14Hr

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### **PURPOSE**

The purpose of this course is to educate and reinforce the knowledge of nurses; ARNP, RN, LPN, CNA /HHA, therapists and other individuals who are working in the health care environment, as well as other students/ individuals regarding Obstetrics /Gynecology, steps to promote a healthy pregnancy, changes that occur during the First, second and third Trimester, some abnormalities encountered that the women may encounter such as Ectopic pregnancy, molar pregnancy (Hydatidiform mole) and other complications during pregnancy such as, preeclampsia, gestational diabetes, anemia, hypertension etc. Review of Braxton Hicks contractions, Medication use during pregnancy, Stages of labor, terms related to Fetal positions, Pain relief measures during labor and much more.

### **Objectives/ Goals:**

After successful completion of this course the students will be able to:

1. Describe the steps to promote a healthy pregnancy
2. Discuss changes that occur during the First, second and third Trimester
3. Discuss Ectopic pregnancy, molar pregnancy (Hydatidiform mole)
4. Detail some of the complication during pregnancy such as, preeclampsia, gestational diabetes, anemia, hypertension.
5. Discuss Braxton Hicks contractions
6. Discuss the use of Medications during pregnancy
7. Describe the Stages of labor
8. Discuss terms related to Fetal positions
9. Discuss Pain relief measures during labor
10. Discuss various obstetrics terminology

## INTRODUCTION

### OBSTETRICS

Obstetrics is the field of medical science that deals with childbirth, caring for and treating women in or in connection with childbirth (concerned with prenatal and postnatal care and with the delivery of a child).

### GYNECOLOGY

Gynecology is the branch of medicine that deals with the health of the female reproductive system (Uterus, fallopian tubes, ovaries and vagina).

Gynecologists often treat conditions such as:

- Amenorrhea (Absence of menstrual periods),
- Dysmenorrhea (Painful menstrual periods),
- Menorrhagia (Heavy menstrual periods),
- Female incontinence,
- Infertility,
- Cancers and pre-cancers of the female reproductive tract,
- Infections of the female reproductive tract; Infections in the vagina, uterus, cervix
- Prolapse of pelvic organs.

The gynecologist may check/ assess for any abnormalities within the external and internal genitalia of the woman.

A Pap smear test may be performed to check /assess for abnormalities or cancerous cells; a biannual examination maybe done to palpate the cervix, uterus, ovaries and the bony pelvis.

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If any abnormalities are observed when the biannual examination is being performed, abdominal or vaginal ultrasounds may be completed to confirm or investigate further.

## **PREGNANCY**

### **Steps to promote a healthy pregnancy**

#### **Schedule a preconception appointment**

For women who are thinking about becoming pregnant, it would be ideal to consult the health care provider, start taking a daily prenatal vitamin and reach a healthy weight before pregnancy. If the woman has a medical condition, treatment might need to be adjusted to prepare for the pregnancy. The health care provider might also discuss the risk of having a baby with a genetic condition.

#### **Assisted reproductive technology (ART)**

Be cautious when using assisted reproductive technology  
If planning to use ART to get pregnant, consider how many embryos will be implanted. Multiple pregnancies carry a higher risk of preterm labor.

#### **Seek regular prenatal care**

Prenatal visits can help the health care provider monitor the women health and the baby's health. Depending on the circumstances, the women may be referred to a specialist in maternal-fetal medication, genetics, pediatrics or other areas.

#### **Eating a healthy diet**

During pregnancy, the women will need more folic acid, calcium, iron and other essential nutrients. Therefore;

–Daily prenatal vitamin is initiated.

Consult the health care provider if the women have special nutrition needs due to a health condition, for example diabetes.

#### **Gain weight wisely**

–Gaining the right amount of weight can support the baby's health

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–Also gaining the right amount of weight can make it easier to shed the extra pounds after delivery.

Avoid risky substances

–Quit smoking

–Avoid Alcohol and illegal drugs

–Consult the health care provider before starting or stopping any medications or supplements.

### **THE PREGNANT WOMAN**

#### **Ovulation**

Every month a group of eggs (oocytes) are taken from the ovary for ovulation. Ovulation is when a mature the egg is released. The eggs develop in the follicles (small fluid-filled cysts). Normally, one follicle in the group is selected to complete maturation. This dominant follicle suppresses all the other follicles in the group, which stop growing and degenerate.

The mature follicle opens and releases the egg from the ovary. Ovulation usually occurs about two weeks before the next menstrual period starts.

After ovulation, the ruptured follicle develops into a structure called the corpus luteum, which secretes progesterone and estrogen. The progesterone helps prepare the endometrium (lining of the uterus) for the embryo to implant.

On average, fertilization occurs about two weeks after the last menstrual period.

When the sperm penetrates the egg, changes occur in the protein coating around it to prevent other sperm from entering. At the moment of fertilization, the embryo's genetic make up is complete, including the sex.

If a Y sperm fertilizes the egg, the baby will be a boy; if an X sperm fertilizes the egg, the baby will be a girl.



## TWINS

Twins can either be monozygotic or identical. This means that they can develop from just one zygote that will then split and form 2 embryos, or dizygotic or fraternal, which means that they can develop from 2 different eggs; each are fertilized by separate sperm cells.



## FACTS ABOUT THE MALE REPRODUCTIVE SYSTEM

The male's reproduction system produces male sex cells (sperm cells). The primary organs of the male's reproduction system are the 2 testes in which the sperm cells are formed. The hypothalamus and pituitary gland control how much testosterone the testes produce and secrete. Leydig cells (interstitial cells of Leydig), are found adjacent to the seminiferous tubules in the testicle. They produce testosterone.

## Human chorionic gonadotrophin (hCG)

Human chorionic gonadotrophin (hCG) - hormone present in the blood from the time of conception. It is produced by cells that form the placenta and is the hormone detected in a pregnancy test; blood or urine test. Human chorionic gonadotropin hormone (hCG) is only made during pregnancy.

### Some hCG tests;

- measure the exact amount and
- some only check if the hormone is present.

However, it usually takes three to four weeks from the first day of the last period for the hCG to increase enough to be detected by pregnancy tests.

Within 24 hours after fertilization, the egg begins to divide quickly into many cells. It remains in the fallopian tube for about three days. The fertilized egg is called a blastocyte and it continues to divide as it moves slowly through the fallopian tube to the uterus. The blastocyte breaks out of the protective covering and it attaches to the endometrium of the uterus. This process is called implantation.

Some women experience spotting / slight bleeding for 1 or 2 days around the time of implantation. The endometrium becomes thicker and the cervix is sealed by a mucus plug.

Within three weeks, the blastocyte cells ultimately form an embryo (a small ball) and the baby's first nerve cells have formed.

The developing baby is called;

- an embryo from the moment of conception to the eighth week of pregnancy.

–After the eighth week and until the moment of birth, the developing baby is called a fetus.

The development stages of pregnancy are called trimesters (3 month periods), due to the distinct changes that occur in each stage.

## UTERUS

The uterus is a female reproductive organ located between the bladder and the rectum, in the pelvic area.

The uterus has three layers:

- the inner lining (endometrium);
- the middle muscular layer (myometrium); and
- the outer layer (perimetrium)- serous membrane

The uterus is connected to the fallopian tubes, the cervix, and (via the cervix) the vagina.

The main purpose of the uterus is to nourish a fetus prior to birth. In menstruating females, the ovaries release eggs that travel via the fallopian tubes to the uterus. If fertilized, the eggs will bind themselves to the wall of the uterus and the fetus will develop. The uterus nourishes and protects the fetus until birth.

The myometrium layer assists with labor in pushing the baby out of the uterus via the cervix and vagina. The serosa layer allows the uterus to move in the pelvic and abdominal areas as required, without damaging other organs or allowing the uterus to be damaged in turn.

## HORMONAL CHANGES DURING PREGNANCY

Hormonal and physiologic changes occur during pregnancy. The pregnant women experience sudden and dramatic;

- Increases in estrogen and
- progesterone,
- as well as changes in the amount and function of a number of other hormones such as Human chorionic gonadotropin hormone (hCG), Human placental lactogen (hPL).

These changes do not only affect mood, but they can also create the glow of pregnancy, significantly aid in the development of the fetus, and alter the physical

impact of physical activity on the body.

## Estrogen

Estrogen is responsible for the development of the female sexual characteristics. Normally formed in the ovaries, estrogen is also made by the placenta during pregnancy to help maintain a healthy pregnancy.

The increase in estrogen during pregnancy:

- Allows the uterus and placenta to improve vascularization,
- Transfer nutrients,
- Support the developing baby.
- Play an important role in helping the fetus develop and mature.

Estrogen levels rises steadily during pregnancy and reaches peak in the third trimester. The rapid increase in estrogen levels during the first trimester may cause some of the nausea that is associated with pregnancy.

During the second trimester, the increase estrogen plays a major role in the milk duct development that enlarges the breasts.

## Progesterone

Progesterone hormone is made by the ovaries and by the placenta during pregnancy. Progesterone stimulates the thickening of the uterine lining in anticipation of implantation of a fertilized egg. Progesterone levels also are extraordinarily high during pregnancy.

**The changes in progesterone also cause:**

- Loosening of ligaments and joints throughout the body
- Internal structures to increase in size, such as the ureters (which connect the kidneys with the maternal bladder).

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Progesterone also is important for transforming the uterus from the size of a small pear in the non-pregnant state to a uterus that can accommodate a full-term baby.

### **Human chorionic gonadotropin hormone (hCG)**

- Human chorionic gonadotropin hormone (hCG) is only made during pregnancy; almost exclusively within the placenta.
- HCG hormone level that is found in maternal blood and urine increase dramatically during the first trimester.
- HCG may also contribute to causing nausea and vomiting often associated with pregnancy.

### **Human placental lactogen (hPL)**

- Human placental lactogen (hPL) hormone, also called human chorionic somatomammotropin, is made by the placenta.
- HPL provides nutrition for the fetus and stimulates milk glands in the breasts in anticipation for breastfeeding.

## **Duration of Pregnancy**

- a. The length of pregnancy varies greatly. Nevertheless, the normal duration of pregnancy is about 9 1/2 to 10 months (lunar), 38 to 40 weeks.
- b. It is usually not possible to determine the actual time of fertilization because reliable records concerning sexual activities are seldom available. However, the approximate time can be calculated.
- c. The estimated date of confinement (EDC) is calculated as follows:

- (1) The first day of last menstrual period.
- (2) Count back 3 months.
- (3) Add seven days.
- (4) Add one year.

## Components of Fetal Circulation

As the placenta functions as the intermediary organ of transfer between the mother and the fetus, fetal circulation differs from that required for extrauterine existence.

The fetus receives oxygen through the placenta because the lungs do not function as organs of respiration while fetus is in the uterus.

The fetal circulation contains special vessels that shunt the blood around the lungs, with only small amount circulating through them for the nutrition;

- The umbilical vein transports blood (rich in oxygen & nutrients) from the placenta to the fetal body. This vein travels along the anterior abdominal wall of the fetus to the liver, and at the porta hepatis the umbilical vein divides into two branches.
- About 1/2 of the blood passes into the liver and the remaining enters a shunting vessel called the ductus venosus that bypasses the liver. The ductus venosus travels a short distance; joins the inferior vena cava.
- There, the oxygenated blood from the placenta is mixed with deoxygenated blood from the lower parts of the fetal body. This blood continues through the vena cava to the right atrium.
- As the blood (high in oxygen) enters the right atrium of the fetal heart, a large amount of it is shunted directly into the left atrium through an opening in the atrial septum (foramen ovale).

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- The more highly oxygenated blood that enters the left atrium through the foramen ovale is mixed with a small amount of deoxygenated blood returning from the pulmonary veins. This mixture moves into the left ventricle and is pumped into the aorta.
- Some of the blood reaches the myocardium by means of the coronary arteries while some reaches the tissues of the brain through the carotid arteries.
- The rest of the blood entering the right atrium, and a large proportion of the deoxygenated blood entering from the superior vena cava, passes into the right ventricle and out through the pulmonary artery.
- Enough blood reaches the lung tissues to sustain them.
- Most of the blood in the pulmonary artery bypasses the lungs by entering the ductus arteriosus, which connects the pulmonary artery to the descending portion of the aortic arch.
- Some of the blood that is carried by the descending aorta leads to the various parts in the lower regions of the body.
- The rest of the blood passes into the umbilical arteries which branch from the internal iliac arteries and lead to the placenta.

Changes Continue in Circulation after Birth.

## Multi-Fetal Pregnancies

- a. Multi-fetal pregnancy is a pregnancy involving two or more fetuses.
- b. Twin fetuses may originate several ways.

(1) Identical twins (monozygotic) originate from the same ovum and are always of the same sex. They share a single placenta.

(2) Fraternal twins (dizygotic) originate from two separate ova and sperm and may be of different sexes. They each have their own placenta.

c. Pregnancies involving more than two fetuses (that is, triplets, quadruplets) may occur by either situation.

Monozygotic--all will be identical.

Multi-zygotic--often associated with fertility drugs in which the ovary matured and released many eggs in the same cycle.

## Stages of Growth: Month by Month

### Month 1

As the fertilized egg grows, a water tight sac forms around it gradually filling with fluid. This is called the amniotic sac, and it helps to cushion the growing embryo.

The placenta also develops.

The placenta is a round, flat organ that transfers nutrients from the mother to the baby, and transfers wastes from the baby.

A primitive face will take form with large dark circles for eyes.

The mouth, lower jaw, and throat are developing.

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Blood cells are taking shape, and circulation will begin.  
The tiny heart tube will beat 65 times a minute by the end of the 4th week.

### Month 2

The baby's facial features continue to develop.  
Each ear begins as a little fold of skin at the side of the head.  
Tiny buds that eventually grow into arms and legs are forming. Fingers, toes and eyes are also forming. The neural tube (brain, spinal cord and other neural tissue of the central nervous system) is well formed.

The digestive tract and sensory organs begin to develop.  
Bone starts to replace cartilage.  
The head is large in proportion to the rest of the baby's body.  
By the end of the second month, your baby is about 1 inch long and weighs about 1/30 of an ounce.

About 6 weeks, the baby's heart beat can usually be detected.  
After the 8th week, the baby is called a fetus instead of an embryo.

### Month 3

The baby's arms, hands, fingers, feet, and toes are fully formed.  
The baby can open and close its fists and mouth.  
Fingernails and toenails are beginning to develop and the external ears are formed. The beginnings of teeth are forming. The baby's reproductive organs also develop, but the baby's gender is difficult to distinguish on ultrasound.

By the end of the third month, the baby is fully formed.  
All the organs and extremities are present and will continue to mature in order to become functional. The circulatory and urinary systems are working and the liver produces bile.  
At the end of the third month, the baby is about 4 inches long and weighs about 1 ounce.

The chance of miscarriage drops considerably after three months.

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### Month 4

The baby's heartbeat may now be audible through an instrument called a doppler.

The fingers and toes are well-defined.

Eyelids, eyebrows, eyelashes, nails, and hair are formed.

Teeth and bones become denser.

The baby can even suck his or her thumb, yawn, stretch, and make faces.

The nervous system is starting to function.

The reproductive organs and genitalia are now fully developed, and the physician can see on ultrasound if whether it is a boy or a girl.

By the end of the fourth month, the baby is about 6 inches long and weighs about 4 ounces.

### Month 5

The women may begin to feel the baby move, since he or she is developing muscles and exercising them. This first movement is called quickening.

Hair begins to grow on baby's head. The baby's shoulders, back, and temples are covered by a soft fine hair called lanugo.

This hair protects your baby and is usually shed at the end of the baby's first week of life.

The baby's skin is covered with a whitish coating called vernix caseosa. This cheesy substance is thought to protect baby's skin from the long exposure to the amniotic fluid.

This coating is shed just before birth.

By the end of the fifth month, the baby is about 10 inches long and weighs from 1/2 to 1 pound.

### Month 6

The baby's skin is reddish in color, wrinkled, and veins are visible through the baby's translucent skin. Baby's finger and toe prints are visible. The eyelids begin to part and the eyes open.

Baby responds to sounds by moving or increasing the pulse. If born prematurely, the baby may survive after the 23rd week with intensive care.

By the end of the sixth month, the baby is about 12 inches long and weighs about 2 pounds.

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### Month 7

The baby will continue to mature and develop reserves of body fat. The baby's hearing is fully developed. He or she changes position frequently and responds to stimuli, including sound, pain, and light. The amniotic fluid begins to diminish.

At the end of the seventh month, the baby is about 14 inches long and weighs from 2 to 4 pounds. If born prematurely, the baby would be likely to survive after the seventh month.

### Month 8

The baby will continue to mature and develop reserves of body fat. The baby is kicking more. Baby's brain is developing rapidly at this time, and the baby can see and hear. Most internal systems are well developed, but the lungs may still be immature. The baby is about 18 inches long and weighs as much as 5 pounds.

### Month 9

The baby continues to grow and mature: the lungs are nearly fully developed. The baby's reflexes are coordinated so he or she can blink, close the eyes, turn the head, grasp firmly, and respond to sounds, light, and touch. Baby is ready to be born. The baby moves less due to tight space.

The baby's position changes to prepare itself for labor and delivery. The baby drops down in the pelvis. The baby's head is down toward the birth canal. The baby is about 18 to 20 inches long and weighs about 7 pounds.

### **Changes in Circulation after Birth**

- The umbilical vein is obliterated and becomes the round ligament of the liver.
- The umbilical arteries are obliterated and ultimately become ligaments.
- The ductus venosus is obliterated and becomes a ligament.

Anatomic closure is completed at the end of 2 months.

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The ductus venosus is superficially embedded in the wall of the liver.  
The ductus arteriosus is obliterated and becomes a ligament.  
Functional closure takes 3-4 days; anatomic closure is completed by 3 weeks.  
The constriction seems to be stimulated by a substance called Bradykinin, which is released from the lungs during their initial expansions.

The foramen ovale closes after the umbilical cord is tied and cut.  
A large amount of blood is returned to the heart and the lungs.

With the lungs now functioning, there is equal pressure on both atria as the vessels constrict.

Failure of the foramen ovale to close spontaneously results in an atrial septal defect, which may or may not require surgery later.

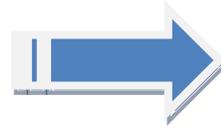
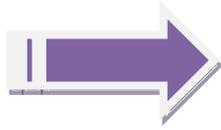
### **Principles of Fetal Immunology**

During the third trimester, passive immunity to some diseases is provided by the mother.

Diseases that the fetus receives temporary protection from include:

- (1) Rubella.
- (2) Diphtheria.
- (3) Measles.
- (4) Poliomyelitis.
- (5) Tetanus.
- (6) Mumps.

Passive immunity is short term and infants must begin immunization against the above diseases by the age of 2 months.



## **Pregnancy and the Stages of Labor and Childbirth**

### **FIRST TRIMESTER**

Pregnancy is different for every woman.

Some women experience good health and vitality during those first three months; others feel miserable.

Here are some of the changes the women may experience, what they mean, and which signs warrant a call to the physician.

#### **Bleeding**

About 25% of pregnant women experience slight bleeding during their first trimester. Early in the pregnancy, light spotting may be a sign that the fertilized embryo has implanted in the uterus, update the physician. Also, if there is significant bleeding, cramping, or sharp pain in the abdomen, the physician has to be called.

These could be signs of a miscarriage or ectopic pregnancy (a pregnancy in which the embryo implants outside of the uterus).

#### **Breast tenderness**

Sore breasts are one of the earliest signs of pregnancy. They are triggered by hormonal changes, which are preparing the milk ducts to feed the baby, and will probably last through the first trimester. Going up a bra size (or more) and wearing a support bra can make the pregnant woman feel more comfortable.

#### **Constipation**

During pregnancy, the muscle contractions that normally move food through the intestines slow down because of higher levels of the hormone progesterone. Add to that the extra iron from the prenatal vitamin, causing constipation and gas that can keep the individual feeling bloated throughout the pregnancy.

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Increase the fiber intake and drink extra fluids to keep things moving more smoothly. Physical activity can also help.

If constipation becomes a severe problem consult with the physician about what mild laxative or stool softeners are safe to use during pregnancy.

### **Discharge**

It is normal to see a thin, milky white discharge (called leukorrhea) early in the pregnancy. The individuals can wear a panty liner if it makes them feel more comfortable, but should not use a tampon because it can introduce germs into the vagina.

If the discharge is foul-smelling, green, or yellow, or if there is a lot of clear discharge, the physician should be consulted.

### **Fatigue**

The body is working hard to support a growing fetus, which can wear the women out, more easily than usual. Teach them to take naps or rest when they need to throughout the day. Also make sure there is enough iron intake (too little can lead to anemia, which can cause excess fatigue).

### **Food cravings and aversions**

The taste buds can change while pregnant. More than 60% of pregnant women experience food cravings, and more than half have food aversions, according to research.

Giving in to cravings from time to time is alright, provided the women are generally eating healthy, low-calorie foods.

The exception is pica (a craving for non-foods like clay, dirt, and laundry starch), which can be dangerous for the woman and the baby.

Report this to the physician.

### **Frequent urination**

The baby is still pretty small, but the uterus is growing and it is putting pressure on the bladder.

As a result, the women may feel like they constantly need to go to the bathroom.

Encourage to continue drinking fluids !!!

The body needs fluids but reduce caffeine intake (which stimulates the bladder),

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especially before bedtime.

### **Heartburn**

During pregnancy, the body produces more of the progesterone hormone which relaxes smooth muscles (the ring of muscle in the lower esophagus that normally keeps food and acids down in the stomach) is affected.

This muscle relaxation can lead to acid reflux (heartburn).

To avoid the heartburn,

- Eat frequent, smaller meals throughout the day;
- Do not lie down right after eating; and
- avoid greasy, spicy, and acidic foods (like citrus fruits).

Raise up pillows when sleeping.

### **Mood swings**

Increased fatigue and changing hormones can cause the women to become emotional. (alternately elated miserable, crying, cranky, terrified).

If they are feeling overwhelmed, encourage them to find an understanding ear from the partner, from a friend or family member.

### **Morning sickness**

Nausea is one of the most universal pregnancy symptoms, affecting up to 85% of pregnant women. It is the result of hormone changes in the body, and it can last through the entire first trimester. For some pregnant women, nausea is mild; others cannot spend a day without vomiting. Nausea is usually worst in the morning (morning sickness).

#### **To calm the nausea;**

- Try eating small, bland, or high-protein snacks (crackers, meat, or cheese)
- Sip on water, clear fruit juice (apple juice), or ginger ale (before getting out of bed).
- Avoid any foods that cause sickness to the stomach.

Nausea itself is not anything to worry about, but if it persists or is severe, it can affect the amount of nutrition getting to the baby.

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### **Weight gain**

During the first trimester, the pregnant woman should gain about 3 to 6 pounds. The pregnant woman only need about an extra 150 calories a day during the first trimester.

Patient teaching involves encouraging the women to get those calories the healthy way, by adding;

- Extra fruits and vegetables,
- milk,
- whole-grain bread, and
- lean meat into their diet.

### **Signs /Symptoms that something is wrong**

The following signs/symptoms could be a sign that something is seriously wrong with the pregnancy;

- Severe abdominal pain.
- Significant bleeding.
- Severe dizziness.
- Rapid weight gain or too little weight gain.

### **Second Trimester of Pregnancy**

Within the second trimester of pregnancy,

the morning sickness and fatigue should be fading, leaving a feeling of more energy. The second trimester is often the easiest three months of pregnancy. This is a good time to start planning for the baby's arrival.

During the second trimester, the baby is growing quickly.

Between the 18th and 22nd week of pregnancy the physician will order an ultrasound to assess how the baby is progressing.

At this stage the pregnant woman can learn the sex of the baby.

### **Changes in the Body**

#### **Backache**

The extra weight gained in the last few months is starting to put pressure on the back,

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making it sore and achy.

To ease the pressure, sit up straight and use a chair that provides good back support.

Sleep in the side lying position with a pillow tucked between the legs.

Avoid picking up or carrying anything heavy. Wear low-heeled, comfortable shoes with good arch support. If the pain is really uncomfortable, the pregnant women may schedule a pregnancy massage or their partner can rub the sore spots.

### **Bleeding gums**

About half of pregnant women develop swollen, tender gums. Hormone changes are sending more blood to the gums, making them more sensitive and causing them to bleed more easily.

The gums should go back to normal after the baby is born.

### **Patient teaching should include:**

–use a softer toothbrush and be gentle when flossing,

–Perform regular schedule oral hygiene, Studies show that pregnant women with gum disease (periodontal disease) may be more likely to go into premature labor and deliver a low-birth-weight baby.

### **Breast enlargement**

Much of the breast tenderness the pregnant woman experienced during the first trimester should be wearing off, but the breasts are still growing as they prepare to feed the baby.

Going up a bra size (or more) and wearing a good support bra can assist the women to feel more comfortable.

### **Congestion and nosebleeds**

Hormonal changes cause the mucus membranes lining the nose to swell, which can lead to a stuffy nose and make the pregnant women snore at night.

These changes may also make the nose bleed more easily.

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### **Patient teaching should include:**

Before using a decongestant, check with the physician;

–Saline drops and other natural methods may be safer ways to clear congestion during pregnancy.

–using a humidifier to keep the air moist.

Teaching regarding how to stop a nosebleed; such as not to tilt the head back and apply pressure to the nostril for a few minutes until the bleeding stops.

### **Discharge**

It is normal to see a thin, milky white vaginal discharge (called leukorrhea) early in the pregnancy. The women can wear a panty liner to feel more comfortable, but avoid using tampons because it can introduce germs into the vagina.

If the discharge is foul-smelling, green or yellow, bloody, or if there's a lot of clear discharge, call the physician.

### **Frequent urination**

The uterus will rise away from the pelvic cavity during the second trimester, giving you a brief break from having to keep going to the bathroom.

The urge to go will come back during the last trimester of the pregnancy.

### **Hair growth**

Pregnancy hormones can boost hair growth

–Some women will have thicker hair growth on their head.

–They may also see hair growth on the face, arms, and back.

Shaving or tweezing might be the safest options.

Many experts do not recommend laser hair removal, electrolysis, waxing, or depilatories (a cosmetic preparation used to remove hair from the skin) during pregnancy; because research still has not proven that they are safe for the baby.

### **Headache**

Headaches are one of the most common pregnancy complaints.

Try to get plenty of rest, and practice relaxation techniques, such as deep breathing.

AVOID Aspirin and ibuprofen during pregnancy; Tylenol/ acetaminophen is used.

### **Heartburn (Pyrosis)**

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These are caused by the body making more of a hormone called progesterone. This hormone relaxes certain muscles, including the ring of muscle in the lower esophagus that normally keeps food and acids down in the stomach, and the ones that move digested food through the intestines.

Heartburn is a burning sensation in the epigastric and sternal region.

It results from relaxation of the cardiac sphincter and the decreased tone and mobility of smooth muscles which is due to increased progesterone thereby allowing for esophageal regurgitation, decreased emptying time of the stomach, and reverse peristalsis.

### **Nursing interventions consist of advising the patient to:**

Eat frequent, small meals.

Take sips of milk or hot tea.

Eat slowly.

Avoid fatty and gas-forming foods.

Maintain good posture to give the gastrointestinal tract lots of space.

Do not lie down after eating.

avoid acidic foods (such as citrus fruits).

### **constipation**

The gastrointestinal tract motility is slowed due to increased progesterone resulting in increased reabsorption of water and drying of stool; and compression of the intestines by the enlarging uterus.

Predisposition to constipation due to oral iron supplement (side effect of iron therapy is constipation). Some patients respond with diarrhea.

Nursing intervention consists of advising the patient to:

Drink at least six glasses of water per day.

Increase roughage in the diet (for example, bran, coarse ground cereals, and fresh fruits and vegetables with skins).

Do moderate exercise every day, especially walking.

Maintain a regular schedule for bowel movements.

Utilize deep breathing and relaxation techniques

## Hemorrhoids

Hemorrhoids are actually varicose veins (swollen blue or purple veins) that form around the anus. These veins may enlarge during pregnancy, because extra blood is flowing through them and there is increased pressure on them from the growing uterus.

Varicose veins can be itchy and uncomfortable.

- To relieve them, encourage sitting in a warm tub or sitz bath.
- Remind the pregnant woman not to use any over-the-counter hemorrhoid ointment without first consulting with the physician.

## Quickening

By the midpoint of the pregnancy (20 weeks) the pregnant woman will probably have started to feel the first delicate flutters of movement in the abdomen, which is called quickening (the fetal first movements). Some women experience quickening as early as 13-16 weeks, others do not experience quickening until the sixth month of pregnancy.

## Skin changes

Pregnant women experience changes in their hormone levels that:

- Makes the skin on the face appear flushed (look as though they are glowing).
- An increase in the pigment melanin can also lead to brown marks on the face (often called the mask of pregnancy) and a dark line (linea nigra) down the middle of the abdomen. All of these skin changes should fade after the baby is born.

The skin is also more sensitive to the sun at this time, so make sure to wear a broad-spectrum (UVA/UVB protection) sunscreen with an SPF of at least 30 whenever they go outside.

Limit the time in the sun, especially between 10 a.m. and 2 p.m., wearing long-sleeved clothes, pants, a broad-brimmed hat, and sunglasses.

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### **Other skin changes that may be observed include:**

–Thin, reddish-purple lines on the abdomen, breasts, or thighs. These stretch marks emerge as the skin expands to accommodate the growing belly.

Although many creams and lotions claim to prevent or eliminate stretch marks, there is little evidence that they actually do. Using a moisturizer can help soften the skin and reduce itchiness. Most stretch marks should fade on their own after the delivery.

### **Spider and varicose veins**

The circulation has increased to send extra blood to the growing baby.

That excess blood flow can cause tiny red veins, known as spider veins, appear on the skin. These veins should eventually fade once the baby is born.

Pressure on the legs from the growing baby can also slow blood flow to the lower body, causing the veins in the legs to become swollen and blue or purple. These are called varicose veins.

Although there is no way to avoid varicose veins;

–by getting up and moving throughout the day

–propping up the legs on a stool whenever they need to sit for long periods of time, can prevent them from getting worse

–by also wearing support hose for extra support.

Varicose veins should improve within three months after the delivery.

### **Weight gain**

Morning sickness usually diminishes by the end of the first trimester.

After that, the appetite should return, and will probably increase. Although food is looking much more appetizing, the pregnant woman needs to be aware of how much they are eating.

The pregnant women only need about an extra 300 to 500 calories a day during the second trimester, and should be gaining about 1/2 to 1 pound a week.

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### Signs/Symptoms that something is wrong

Any of these symptoms could be a sign that something is wrong with the pregnancy.

Teach the patient not to wait for the prenatal visit to talk about it but to contact the physician as soon as they symptoms such as:

- Severe abdominal pain or cramping
- Bleeding
- Severe dizziness
- Rapid weight gain (more than 6.5 pounds per month) or too little weight gain (less than 10 pounds at 20 weeks into the pregnancy).

### Third Trimester of Pregnancy

#### Changes in the Body

##### Backache

The extra weight gain is putting added pressure on the back, making it feel achy and sore. The pregnant women may also feel discomfort in the pelvis and hips as the ligaments loosen to prepare for labor.

To ease the pressure on the back,

- teach the pregnant woman to practice good posture.
- Sit up straight and use a chair that provides good back support.
- At night, sleep in the side lying position with a pillow between the legs.
- Wear low-heel, comfortable shoes with good arch support.
- To relieve back pain, use a heating pad and
- Consult with the physician whether acetaminophen is safe to take.

##### Bleeding

Spotting may sometimes be a sign of a serious problem, including:

- placenta previa (the placenta grows low and covers the cervix),
- placental abruption(separation of the placenta from the uterine wall), or
- Preterm labor.

The physician should always be contacted when bleeding is observed.

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### Braxton Hicks contractions

Some women may start to feel mild contractions, Braxton Hicks contractions often are not as intense as real labor contractions, but they may feel a lot like labor and can eventually progress to it. One main difference is that real contractions gradually get closer and closer together and more intense.

### **CALL THE PHYSICIAN**

–Teach the women that if they feel flushed and out of breath after the contractions, or they are coming regularly, call the physician.

### **Breast enlargement**

By the end of the pregnancy, the breasts will have grown by as much as 2 pounds. Teach the women to wear supportive bra so that they do not have extreme back ache/pains.

Close to the due date, some women may start to see a yellowish fluid leaking from the nipples. This substance, called colostrum, will nourish the baby in the first few days after birth.

### **Discharge**

Some women may experience more vaginal discharge during the third trimester. If the flow is heavy enough to soak through the panty liners, call the physician. Close to the delivery date, there might be a thick, clear, or slightly blood-tinged discharge. This is the mucus plug, and it is a sign that the cervix has begun dilating in preparation for labor.

A sudden rush of fluid, it may mean the water has broken; Only about 8% of pregnant women have their water break before contractions begin. Teach the women that they need to call the physician after the water breaks.

### **Fatigue**

Some women may feel energetic in the second trimester, but are become fatigued after that.

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Fatigue may be caused by several factors:

- Carrying extra weight,
- waking up several times during the night to go to urinate
- dealing with the anxiety of preparing for the baby

The women need to:

- Eat healthy food and get regular exercise
- Take a nap when feeling tired, or sit down and relax for a few minutes.

### **Frequent urination**

The baby is much bigger and the baby's head may be pressing down on the urinary bladder. That extra pressure means the women will have to go to the bathroom more frequently.

Some women may also leak urine when they cough, laugh, sneeze, or exercise.

Teach the women to relieve the pressure and prevent leakage by:

- Using to the bathroom whenever they feel the urge to urinate.
- Avoid drinking fluids just before bedtime to cut down on frequent nighttime bathroom use.
- Wear a panty liner to absorb any leakage that does occur.
- Call physician if experiencing any pain or burning with urination (may be signs of a urinary tract infection).

### **Heartburn and constipation**

Caused by extra production of progesterone, which relaxes certain muscles including the muscles in the esophagus that normally keep food and acids down in the stomach, and the ones that move digested food through the intestines.

To relieve heartburn, try eating more frequent, smaller meals throughout the day and avoid greasy, spicy, and acidic foods (like citrus fruits).

### **For constipation,**

- increase fiber intake
- drink extra fluids to keep things moving.

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### **Hemorrhoids**

As mentioned before, hemorrhoids are actually varicose veins (swollen blue or purple veins) that form around the anus.

These veins may enlarge during pregnancy, because extra blood is flowing through them and there is increased pressure on them from the growing uterus.

Varicose veins can be itchy and uncomfortable.

–To relieve them, encourage sitting in a warm tub or sitz bath.

–Remind the pregnant woman not to use any over-the-counter hemorrhoid ointment without first consulting with the physician.

Discomforts Related to the Cardiovascular Systems

### **Supine Hypotension (Vena Cava Syndrome)**

Supine hypotension is caused by pressure of the gravid uterus on the ascending vena cava when the woman is lying in a supine position which decreases the return of the blood.

Symptoms may include:

–nausea,

–cold /clammy,

–feels faint,

–Decreased blood pressure

### **Nursing interventions consist of instructing the women to:**

Rise up /get up slowly

Use the side lying position (left side preferred).

### **Shortness of breath**

As the uterus expands, it rises up until it sits just under the rib cage, leaving less room for the lungs to expand.

That added pressure on the lungs can make it more difficult to breathe.

Exercising can help with shortness of breath. The women can also try propping up their

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head and shoulders with pillows while they sleep.

### **Dyspnea**

Dyspnea is caused by the limited expansion of the diaphragm by the enlarging uterus. It may be an increased sensitivity to or compensation for slight acidosis.

Dyspnea may be very troublesome in the last weeks of pregnancy. The patient may have difficulty sleeping.

### **Nursing interventions consist of advising the patient to:**

- (1) Sleep on additional pillows.
- (2) Maintain good posture.
- (3) Avoid overeating.
- (4) Stop or decrease smoking.
- (5) Limit activity before becoming dyspneic.
- (6) Decrease anxiety by concentrating on slow, deep breaths.

Dyspnea of sudden onset in patients who are known to have heart disease may be a sign of impending heart failure.

The physician should be notified immediately.

### **Nasal Stuffiness**

Nasal stuffiness is caused by increased vascularization due to the increase in hormone. It is not preventable; functioning of the nasal will return to normal after delivery.

### **Spider and varicose veins**

The circulation has increased to send extra blood to the growing baby.

That excess blood flow can cause tiny red veins, known as spider veins, appear on the skin. These veins should eventually fade once the baby is born.

Pressure on the legs from the growing baby can also slow blood flow to the lower body, causing the veins in the legs to become swollen and blue or purple. These are called varicose veins.

Although there is no way to avoid varicose veins; it may be beneficial to:

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- get up and move throughout the day
- prop up the legs on a stool whenever they need to sit for long periods of time, can prevent them from getting worse
- wear support hose for extra support.

Varicose veins should improve within three months after the delivery.

### **Swelling**

The ankles and face may start to look bloated.

Mild swelling is the result of excess fluid retention called edema.

Rings may feel tighter.

### **To reduce swelling;**

- Elevate feet up on a stool or box whenever sitting for any length of time,
- Elevate feet while sleeping.

### **ALERT!!!**

If there is sudden onset of swelling, must seek medical attention immediately because this may be a sign of preeclampsia (will review later) dangerous pregnancy complication.

### **Backache.**

Backache is caused by;

–relaxation of the sacroiliac joint which is due to increased hormones (steroid sex hormone and relaxing) resulting in slight joint and muscle relaxation and increased mobility; and exaggerated lumbar and cervical thoracic curves caused by changes in the center of gravity from the enlarging abdomen and breasts.

Prevention of strain, which can cause backache, should begin early in pregnancy.

### **Nursing interventions should include advising patient:**

To practice good posture and good body mechanics (use the pelvic tilt and bend at the knees).

To wear appropriate, well-fitting shoes.

To sleep on a firm mattress or backboard.

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That backaches may indicate a kidney or bladder infection.

The patient must inform the physician of backache problems. Backaches should be carefully evaluated.

### **Weight gain**

Aim for a weight gain of 1/2 pound to 1 pound a week during the third trimester.

By the end of the pregnancy, weight gain is a total of about 25 to 35 pounds.

The physician may recommend gain of more or less weight if started out the pregnancy underweight or overweight.

The extra pounds are made up of;

- the baby's weight,
- the placenta,
- amniotic fluid,
- increased blood volume
- increase in fluid volume,
- added breast tissue.

If the baby seems to be too big or too small based on the size of the uterus the physician will do an ultrasound to check the growth.

### **Symptoms that may suggest something is wrong**

Any of these symptoms could be a sign that something is wrong with during pregnancy.

Teach the women to call the doctor right away if they experience:

- Severe abdominal pain or cramps
- Severe nausea or vomiting
- Bleeding
- Severe dizziness
- Pain or burning during urination
- Rapid weight gain (more than 6.5 pounds per month) or too little weight gain

## Taking Medications During Pregnancy



\*No medication can be considered 100% safe to use during pregnancy\*

Prenatal vitamins are safe and important to take when pregnant.

—Ask the health care provider about the safety of taking other vitamins, herbal remedies, and supplements.

—Most herbal preparations and supplements have not been proven to be safe during pregnancy.

—Educate the female that they should not take any OTC medication while pregnant unless it is necessary (always consult the physician before taking).

The following medications and home remedies have no known harmful effects during pregnancy when taken according to the package directions.

Remind the women to speak with the physician for additional information on their safety.

### **\*Medications sometimes Taken During Pregnancy\***

#### **For Allergy**

- Benadryl (diphenhydramine)
- Claritin

Check with the physician before taking these in the especially in the first trimester.

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### **Cold and Flu**

- Tylenol (acetaminophen)
- Saline nasal drops or spray
- Warm salt/water gargle

Check with the physician before taking these in the especially in the first trimester.

### **Constipation**

- Metamucil
- Colace

### **First Aid Ointment**

- Bacitracin
- J & J First-Aid Cream
- Neosporin
- Polysporin

### **Rashes**

- Benadryl cream
- Caladryl lotion or cream
- Hydrocortisone cream or ointment
- Oatmeal bath (Aveeno)

### **Some alternative therapies**

Some have been shown to be safe and effective for pregnant women to relieve some of the uncomfortable side effects of pregnancy; (Consult with physician first before using any of them).

Remember, “Natural” does not always mean safe when pregnant.

### **Nausea in early pregnancy**

- ginger root (250 milligram capsules 4 times a day),
- vitamin B6 (pyridoxine, 25 milligrams two or three times a day)
- Sipping the thick syrup from inside a can of peaches, pears, mixed fruits, pineapples, or orange slices

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### **Backache:**

–Chiropractic manipulation

–Massage but it is important to make sure the massage therapist is adequately trained in pre-natal massage.

### **Pain relief in labor**

–Epidurals are most effective

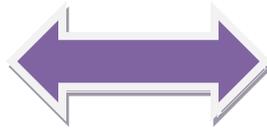
–Immersion in a warm bath can also relieve tension.

–Relaxation and breathing techniques,

–emotional support,

–self-hypnosis

– Acupuncture can also work for some women.



## **SOME COMPLICATIONS**

### **INCOMPETENT CERVICAL OS**

An incompetent cervix (a cervical insufficiency), is a condition that occurs when weak cervical tissue causes or contributes to;

–premature birth or the

–loss of an otherwise healthy pregnancy.

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Before pregnancy, the cervix (the lower part of the uterus that connects to the vagina) is normally closed and rigid. As pregnancy progresses and the pregnant women prepare to give birth, the cervix ;

- gradually softens,
- decreases in length (effaces) and
- opens (dilates).

If the women have an incompetent cervix, the cervix might begin to open too early causing them to give birth too soon.

The cervix is the narrow lower end of the uterus that goes into the vagina.

- In the normal pregnancy, the cervix remains firm, long, and closed until late in the 3rd trimester.
- In the 3rd trimester, the cervix starts to soften, get shorter, and open up (dilate) as the woman's body prepares for labor.

An insufficient cervix may begin to dilate too early in pregnancy. If there is an insufficient cervix, the following problems are more likely to occur:

### **Miscarriage in the 2nd trimester:**

- Labor begins too early, before 37 weeks
- Bag of waters breaks before 37 weeks
- A premature (early) delivery

No one knows exactly what causes an insufficient cervix, but these things may increase a woman's risk:

- Being pregnant with more than 1 baby (twins, triplets)
- Having an insufficient cervix in an earlier pregnancy
- Having a torn cervix from an earlier birth
- Having past miscarriages by the 4th month
- Having past late-term abortions
- Having a cervix that did not develop normally

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- Having a cone biopsy or loop electrosurgical excision procedure (LEEP) on the cervix in the past due to an abnormal Pap smear.

(\*LEEP - a thin, low-voltage electrified wire loop is used to cut out abnormal tissue in the cervix\*)

An incompetent cervix can be difficult to diagnose and treat.

If the cervix begins to open early, the physician/ health care provider might recommend;

- preventive medication during pregnancy,
- frequent ultrasounds or
- a procedure that closes the cervix with strong sutures (cervical cerclage).

### **DIAGNOSIS**

An incompetent cervix is usually detected during pregnancy, and even then diagnosis can be difficult especially during a first pregnancy.

To help diagnose an incompetent cervix, the health care provider will;

- document any symptoms experiencing
- ask about the women medical history; such as pregnancy loss or history of cervical tear during a previous labor and delivery.

The physician health care provider might determine an incompetent cervix if there is:

- A history of painless cervical dilation second trimester deliveries
- A history of short labors
- Earlier deliveries in previous pregnancies

And advanced cervical dilation and effacement before week 24 of pregnancy;

- without painful contractions,

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- without vaginal bleeding,
- without water breaking (ruptured membranes) or
- without infection

Tests and procedures to help diagnose an incompetent cervix during the second trimester include:

### **Transvaginal ultrasound**

If the fetal membranes are not in the vagina or cervical canal the health care provider will use transvaginal ultrasound to;

- evaluate the length of the cervix,
- determine how much the cervix has dilated and
- examine the fetal membranes.

During this type of ultrasound, a slender transducer is placed in the vagina to send out sound waves and gather the reflections of the cervix and lower uterus on a monitor.

### **Pelvic exam**

The health care provider will;

- Examine the cervix to see if the amniotic sac has begun to protrude through the opening -prolapsed fetal membranes.

If the fetal membranes are in the vagina or cervical canal – there is an incompetent cervix.

The health care provider will check for evidence of any congenital conditions or cervical tears that might cause an incompetent cervix.

The health care provider will also check for contractions and, if necessary, monitor them.

## Laboratory tests

If the fetal membranes are visible and an ultrasound shows signs of inflammation but the woman does not have symptoms of an infection;

—the health care provider might test a sample of amniotic fluid – amniocentesis, to diagnose or rule out an infection of the amniotic sac and fluid (chorioamnionitis).

Some tests can be done before pregnancy to help detect uterine abnormalities that might cause an incompetent cervix. For example, the health care provider might suggest an;

ultrasound or magnetic resonance imaging (MRI) ; a procedure that uses a magnetic field and radio waves to create detailed images of the organs and tissues within the body.

In some cases, hysterosalpingography, a procedure that uses X-rays to examine the inside of the uterus, fallopian tubes and surrounding area, is recommended.

## TREATMENT

Progesterone supplementation

If there is a history of premature birth, the health care provider might recommend;

Weekly injections of a form of the hormone progesterone called hydroxyprogesterone caproate (Makena) during the second trimester. However, further research is needed to determine the best use of progesterone in cervical insufficiency. Currently, progesterone treatments do not seem to be helpful for pregnancy with twins or more.

Makena is injected into a muscle (IM) ONCE PER WK.

## CAUTION!!

Should not use Makena if;

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- Allergic to hydroxyprogesterone or castor oil, or
- if there is unusual vaginal bleeding,
- liver disease or liver cancer,
- breast cancer,
- uterine cancer,
- uncontrolled high blood pressure,
- a history of jaundice caused by pregnancy, or
- a history of stroke,
- blood clot, or circulation problems.

### **Serial ultrasounds**

If there is a history of early premature birth, or previous cervical damage in earlier deliveries or operations, the health care provider might begin;

careful monitoring of the length of the cervix by completing ultrasounds every two weeks from week 15 through week 24 of pregnancy. If the cervix begins to open or becomes shorter than a certain length, the health care provider might recommend cervical cerclage.

### **Cervical cerclage**

If less than 24 weeks pregnant or have a history of early premature birth and an ultrasound shows that the cervix is opening, a surgical procedure known as cervical cerclage might help prevent premature birth;

- During the procedure, the cervix is stitched closed with strong sutures.
- The sutures will be removed during the last month of pregnancy or during labor.

If there is a have a history of premature births that is likely due to cervical insufficiency, the health care provider might also recommend cervical cerclage before the cervix begins to open- prophylactic cerclage.

This procedure is typically done before week 14 of pregnancy.

Cervical cerclage is not appropriate for everyone at risk of premature birth.

The procedure is not recommended for women carrying twins or more.

### **Pessary**

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The health care provider might also recommend the use of a pessary.

A Pessary- device that fits inside the vagina and is designed to hold the uterus in place.

A pessary can be used to help lessen pressure on the cervix.

However, further research is needed to determine if a pessary is an effective treatment for cervical insufficiency.

### **Risk factors for a high-risk pregnancy**

–A high-risk pregnancy is sometimes the result of a medical condition present before pregnancy.

–In other cases, a medical condition that develops during pregnancy for either mom or baby causes a pregnancy to become high risk.

Specific factors that might contribute to a high-risk pregnancy include:

Advanced maternal age

Pregnancy risks are higher for mothers age 35 and older.

### **Lifestyle choices**

Smoking cigarettes, drinking alcohol and using illegal drugs can put a pregnancy at risk.

Medical history

A prior C-section, low birth weight baby or preterm birth; birth before 37 weeks of pregnancy, might increase the risk in subsequent pregnancies.

### **Other risk factors include;**

–a family history of genetic conditions,

–a history of pregnancy loss or

–the death of a baby shortly after birth.

Underlying conditions

Chronic conditions for examples;

–diabetes,

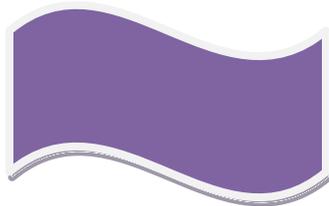
–high blood pressure

–epilepsy increase pregnancy risks.

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- a blood condition, for example anemia,
- an infection
- an underlying mental health condition also can increase pregnancy risks.



### **Pregnancy complications**

Various complications that develop during pregnancy increases risks, for example;

- problems with the uterus,
- problems with the cervix or
- problems with the placenta.

Other concerns might include;

- too much amniotic fluid - polyhydramnios or
- low amniotic fluid (oligohydramnios),
- restricted fetal growth, or
- Rh (rhesus) sensitization ; a potentially serious condition that can occur when the women blood group is Rh negative and the baby's blood group is Rh positive.

### **Multiple pregnancy**

Pregnancy risks are higher for women;

- carrying twins or higher order multiples.

### **Special tests**

High-risk pregnancy, may consider various tests or procedures in addition to routine prenatal screening tests. Depending on the circumstances, the health care provider might recommend:

Specialized or targeted ultrasound

This type of fetal ultrasound; an imaging technique that uses high-frequency sound waves to produce images of the baby in the uterus.

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–The ultrasound targets a suspected problem, for example abnormal development.

### **Amniocentesis**

During the procedure, a sample of the fluid that surrounds and protects the baby during pregnancy (amniotic fluid) is withdrawn from the uterus.

Typically done after week 15 of pregnancy.

Amniocentesis can identify;

- certain genetic conditions,
- neural tube defects; serious abnormalities of the brain or spinal cord.

### **Information obtained by amniocentesis**

#### **Color of fluid**

The fluid is usually colorless.

If it is meconium (stool) stained, it will be greenish brown and this indicates fetal hypoxia.

- Detects fetal chromosomal anomalies such as Down's Syndrome.
- Helps evaluate probability of sex-linked genetic disorders.
- Indicates fetal maturity,
- Indicates in-born errors, or metabolism,
- Indicates disorders like PKU.

#### **Risks of the procedure**

Overall complications are less than 1% for the mother and the fetus.

Possible risks are:

Maternal;

- Hemorrhage.
- Infection.
- Labor.
- Inadvertent damage to the intestines or bladder.

#### **Fetal, Possible risks are:**

Death.

Hemorrhage.

Direct injury from the needle.

Abortion.  
Premature labor.

### **Chorionic villus sampling (CVS)**

During this procedure;

–a sample of cells is removed from the placenta.

–Typically done between weeks 10 and 12 of pregnancy, CVS can identify certain genetic conditions.

### **Cordocentesis (Percutaneous umbilical blood sampling).**

This test, also known as Percutaneous umbilical blood sampling (Cordocentesis), is a highly specialized prenatal test in which a fetal blood sample is removed from the umbilical cord.

Typically done after week 18 of pregnancy, the test can identify;

–chromosomal conditions,

–blood disorders and

–infections.

### **Non-Stress Test**

It evaluates the ability of the placenta to supply fetal needs in a normal (or unstressed) daily uterine environment.

#### **The non-stress test (NST) involves;**

Application of the fetal monitor to record the fetal heart rate.

The mother is instructed to push a marker button when she feels the fetus move.

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The marker button indicates movement as it occurred in relationship to the fetal heart rate.

With sufficient placental functioning, the fetus should demonstrate an acceleration in heart rate with movement, in the same way that the adult experiences increased heart rate with exercises.

A lack of fetal heart rate acceleration indicates the need for further testing.

Non-stress test is used to screen the high-risk pregnancy where the placental compromise is anticipated to include;

- post-term pregnancy,
- pregnancy induced hypertension,
- gestational diabetes,
- intrauterine growth retardation, and
- maternal complaints of decreased fetal movement.

Patients identified as Non-stress test (NST) candidates will generally be required to complete a Non-stress test on a regular basis (weekly, bi-weekly).

## Methods of Contraction Production

### Oxytocin challenge test (OCT)

An intravenous (I.V.) solution of oxytocin is administered to the mother until a contraction pattern is developed. When sufficient information is obtained to evaluate the test, the medication is turned off.

The Oxytocin challenge test evaluates the ability of the placenta to supply fetal needs in a stressed environment. Contractions /Labor are a stress on the pregnancy.

During a contraction, the flow of oxygen from the uterus to the placenta is diminished.

The healthy placenta stores an oxygen reserve so that the fetus does not suffer a diminished supply of oxygen during the contraction.

The Oxytocin challenge test involves application of the fetal monitor to record fetal heart

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rate and contraction activity. Acceptable results include acceleration of fetal heart rate or no change in fetal heart rate baseline during a contraction.

Unacceptable results include deceleration of fetal heart rate during a contraction.

The Oxytocin challenge test is used to evaluate the high-risk pregnancy where the placental compromise is suspected. It is often applied to the high-risk patients.

In addition the Oxytocin challenge test is used to evaluate the patient when a suspicious result is obtained on a Non-stress test. The Oxytocin challenge test is more invasive than the Non-stress test; it provides more conclusive results than the Non-stress test.

### **Breast stimulation test (BST)**

This test involves stimulation of the nipples (by rubbing), which causes the posterior pituitary to release the hormone oxytocin, which in turn, causes contractions.

### **Contraction stress test (CST)**

Evaluation is done in the presence of naturally occurring contractions. Helps in evaluating the respiratory function (oxygen and carbon dioxide exchange) in the placenta.

### **Cervical length measurement**

The health care provider might use;

–an ultrasound to measure the length of the cervix at prenatal appointments to determine if the woman is at risk of preterm labor.

### **Laboratory tests**

#### **Fetal fibronectin**

The health care provider might take a swab of the vaginal secretions to check for fetal fibronectin (a substance that acts like a glue between the fetal sac and the lining of the uterus).

The presence of fetal fibronectin might be a sign of preterm labor.

#### **Biophysical profile**

This prenatal test is used to check on a baby's well-being.

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The test combines ;

- fetal heart rate monitoring (nonstress test) and
- fetal ultrasound.

Some prenatal diagnostic tests carry a small risk of pregnancy loss such as;

- amniocentesis and
- chorionic villus sampling

Specific signs or symptoms to look out for include;

- Vaginal bleeding
- Persistent headaches
- Pain or cramping in the lower abdomen
- Watery vaginal discharge (in a gush or a trickle)
- Regular or frequent contractions ( a tightening sensation in the abdomen)
- Decreased fetal activity
- Pain or burning with urination
- Changes in vision, including blurred vision

### **PREECLAMPSIA**

Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system, often the kidneys.

Preeclampsia usually begins after 20 weeks of pregnancy in a woman whose blood pressure had been normal. Even a slight rise in blood pressure may be a sign of preeclampsia.

Left untreated;

- preeclampsia can lead to serious (even fatal) complications for both the women and

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baby.

If the woman has preeclampsia, the only cure is delivery of the baby.

With diagnosis of preeclampsia too early in the pregnancy to deliver the baby, the baby needs more time to mature; the physician may order some treatment such as medication to lower the blood pressure.

### SYMPTOMS

Preeclampsia sometimes develops without any symptoms.

High blood pressure may develop slowly, but more commonly it has a sudden onset.

Monitoring the blood pressure is an important part of prenatal care because the first sign of preeclampsia is commonly a rise in blood pressure.

—Blood pressure that is 140/90 mm Hg or greater which is documented on two occasions, at least four hours apart and is abnormal.

Other signs and symptoms of preeclampsia may include:

- Excess protein in the urine (proteinuria) or additional signs of kidney problems
- Severe headaches
- Changes in vision, including temporary loss of vision, blurred vision or light sensitivity
- Upper abdominal pain, (usually under the ribs on the right side)
- Nausea or vomiting
- Decreased urine output
- Decreased levels of platelets in the blood (thrombocytopenia)
- Impaired liver function
- Shortness of breath, caused by fluid in the lungs

—Sudden weight gain and edema (swelling)

Particularly in the face and hands often accompanies preeclampsia. But these things also occur in many normal pregnancies..

### CAUSE

The exact cause of preeclampsia is unknown.

Experts believe it begins in the placenta (the organ that nourishes the fetus throughout pregnancy). Early in pregnancy, new blood vessels develop and evolve to efficiently send blood to the placenta.

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In women with preeclampsia, these blood vessels do not seem to develop properly. They are narrower than normal blood vessels and react differently to hormonal signaling, which limits the amount of blood that can flow through them.

### **Causes of this abnormal development may include:**

- Insufficient blood flow to the uterus
- Damage to the blood vessels
- A problem with the immune system
- Certain genes

Other high blood pressure disorders during pregnancy

Preeclampsia is classified as one of four high blood pressure disorders that can occur during pregnancy.

### **The other three are:**

Gestational hypertension

Women with gestational hypertension have high blood pressure but no excess protein in the urine or other signs of organ damage.

Some women with gestational hypertension eventually develop preeclampsia.

## **Chronic hypertension**

Chronic hypertension is high blood pressure that was present before pregnancy or that occurs before 20 weeks of pregnancy. But because high blood pressure usually does not have symptoms, it may be hard to determine when it began.

Chronic hypertension with superimposed preeclampsia

This condition occurs in women who have chronic high blood pressure before pregnancy who then develop worsening high blood pressure and protein in the urine or other health complications during pregnancy.

Preeclampsia develops only as a complication of pregnancy.

### **Risk factors include:**

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### History of preeclampsia

A personal or family history of preeclampsia significantly raises the women risk of preeclampsia.

First pregnancy - (risk of developing preeclampsia is highest during the first pregnancy).

New paternity - Each pregnancy with a new partner increases the risk of preeclampsia over a second or third pregnancy with the same partner.

Age - The risk of preeclampsia is higher for pregnant women older than 40.

Obesity - The risk of preeclampsia is higher if the woman is obese.

Multiple pregnancy - Preeclampsia is more common in women who are carrying twins, triplets or other multiples.

Interval between pregnancies - Having babies less than two years, or more than 10 years apart leads to a higher risk of preeclampsia.

History of certain conditions - Having certain conditions before becoming pregnant increases the risk of preeclampsia for example;

- chronic high blood pressure,
- migraine headaches,
- type 1 or type 2 diabetes,
- kidney disease,
- a tendency to develop blood clots,
- lupus

## COMPLICATIONS

The more severe the preeclampsia and the earlier it occurs in the pregnancy, the greater the risks for the women and the baby.

Preeclampsia may require induced labor and delivery.

Surgical delivery (cesarean section or C-section) may be done if other problems are present, such as a baby in breech presentation, or if a speedy delivery is necessary.

If there is severe preeclampsia or at less than 30 weeks gestation, a C-section may be necessary.

Complications of preeclampsia may include:

Lack of blood flow to the placenta

Preeclampsia affects the arteries carrying blood to the placenta.

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If the placenta does not get enough blood, the baby may receive less oxygen and fewer nutrients;

This can lead to;

- slow growth,
- low birth weight or
- preterm birth.

Prematurity can lead to breathing problems for the baby.

### **Placental abruption**

Preeclampsia increases the risk of placental abruption, in which the placenta separates from the inner wall of the uterus before delivery.

Severe abruption can cause heavy bleeding and damage to the placenta, which can be life-threatening for both the woman and the baby.

### **HELLP syndrome**

H = hemolysis

E = elevated

L - liver enzymes

L = low

P = platelet count

HELLP stands for hemolysis (the destruction of red blood cells), elevated liver enzymes and low platelet count.

HELLP syndrome can rapidly become life-threatening for both the woman and the baby.

Symptoms of HELLP syndrome include:

- nausea and vomiting,
- headache, and
- upper right abdominal pain.

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HELLP syndrome is particularly dangerous because it represents damage to several organ systems. Sometime it may develop suddenly, even before high blood pressure is detected.

### **Eclampsia**

When preeclampsia is not controlled, eclampsia can develop. Eclampsia is preeclampsia with seizures.

Symptoms that suggest imminent eclampsia include;

- upper right abdominal pain,
- severe headache,
- vision problems and
- change in mental status, such as decreased alertness.

Because eclampsia can have serious consequences for both the woman and the baby, delivery becomes necessary, regardless of how far along the pregnancy is.

### Cardiovascular disease

Having preeclampsia may increase the risk of future heart and blood vessel - cardiovascular disease.

The risk is even greater if the women had preeclampsia more than once or if they had a preterm delivery.

To minimize this risk, after delivery the women should;

- maintain an ideal weight,
- Eat a variety of fruits and vegetables,
- Exercise regularly,
- Avoid smoking.

### **DIAGNOSIS**

To diagnose preeclampsia, there has to be high blood pressure and one or more of the following complications after the 20th week of pregnancy:

- Protein in the urine (proteinuria)

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- A low platelet count
- Impaired liver function
- Signs of kidney trouble other than protein in the urine
- Fluid in the lungs (pulmonary edema)
- New-onset headaches
- Visual disturbances

Previously, preeclampsia was only diagnosed if a pregnant woman had high blood pressure and protein in her urine. However, experts now know that it is possible to have preeclampsia, and never have protein in the urine.

A blood pressure reading in excess of 140/90 mm Hg is abnormal in pregnancy (a single high blood pressure reading does not mean preeclampsia).

If there is one BP reading in the abnormal range, then a having a second abnormal blood pressure reading four hours after the first may confirm preeclampsia.

Additional blood pressure readings and blood and urine tests may also be done.

### **Tests that may be needed**

Suspects preeclampsia, other tests, may include:

#### Blood tests

Blood test to determine how well the liver and kidneys are functioning and whether there are normal amount of platelets (cells that help blood clot).

#### Urine analysis

A urine sample that measures the ratio of protein to creatinine.

Urine samples taken over 24 hours can quantify how much protein is being lost in the urine, an indication of the severity of preeclampsia.

#### Fetal ultrasound

Close monitoring of the baby's growth through ultrasound.

The images of the baby created during the ultrasound exam allow the physician to;

- Estimate fetal weight and
- Estimate the amount of fluid in the uterus (amniotic fluid).

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### Nonstress test or biophysical profile

A nonstress test is a simple procedure that checks how the baby's heart rate reacts when the baby moves.

A biophysical profile combines an ultrasound with a nonstress test to provide more information about;

- the baby's breathing,
- the baby's tone,
- the baby's movement and
- the volume of amniotic fluid in the uterus.

### TREATMENT

- The only cure for preeclampsia is delivery.
  
- The pregnant women with preeclampsia, is at increased risk of ;
  - seizures,
  - placental abruption,
  - stroke and
  - possibly severe bleeding until the blood pressure decreases.

If it is too early in the pregnancy, delivery may not be the best thing for the baby.

With a diagnosis of preeclampsia, the physician will schedule more frequent prenatal visits, more frequently than what is typically recommended for pregnancy.

Also may order more blood tests, ultrasounds and nonstress tests than would be expected in an uncomplicated pregnancy.

## Medications

Possible treatment for preeclampsia may include:

### Medications to lower blood pressure

Antihypertensives, are used to lower the blood pressure if it is dangerously high. Blood pressure in the 140/90 millimeters of mercury (mm Hg) range generally is not treated.

Although there are many different types of antihypertensive medications, a number of

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them are not safe to use during pregnancy.

### Corticosteroids

If there is severe preeclampsia or HELLP syndrome, corticosteroid medications can temporarily improve liver and platelet function to help prolong the pregnancy.

Corticosteroids can also help the baby's lungs become more mature (in 48 hours) an important step in preparing a premature baby for life outside the womb.

### Anticonvulsant medications

If the preeclampsia is severe, the physician may order an anticonvulsant medication, such as magnesium sulfate, to prevent a first seizure.

### Bed rest

Bed rest used to be routinely recommended for women with preeclampsia. But research has not shown a benefit from this practice, and it can increase the risk of blood clots. For most women, bed rest is no longer recommended.

### Hospitalization

Severe preeclampsia may require that the women be hospitalized. In the hospital, the physician may perform regular nonstress tests or biophysical profiles to monitor the baby's well-being and measure the volume of amniotic fluid.

A lack of amniotic fluid is a sign of poor blood supply to the baby.

### Delivery

If diagnosed with preeclampsia near the end of the pregnancy, the physician may recommend inducing labor right away.

The readiness of the cervix (if beginning to open/dilate, thin (efface) and soften/ripen) also may be a factor in determining whether or when labor will be induced.

In severe cases, it may not be possible to consider the baby's gestational age or the readiness of the cervix. If it is not possible to wait, the physician may induce labor or schedule a C-section right away.

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During delivery, the women may be given magnesium sulfate intravenously to prevent seizures.

After delivery, expect the blood pressure should return to normal (within 12 weeks but usually much earlier).

Pain-relieving medication after delivery;

Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil, Motrin etc.) and naproxen sodium (Aleve), can increase the blood pressure.

Acetaminophen (Tylenol) is usually a safer alternative.

### **HYDATIDIFORM MOLE**

Hydatidiform mole is a rare mass or growth that forms inside the uterus at the beginning of a pregnancy.

It is a type of gestational trophoblastic disease (GTD)

#### **Causes**

Hydatidiform mole, or molar pregnancy, results from too much production of the tissue that is supposed to develop into the placenta. The placenta feeds the fetus during pregnancy.

With a molar pregnancy, the tissues develop into an abnormal growth, called a mass.

#### **There are 2 types of these masses:**

- Partial molar pregnancy. There is an abnormal placenta and some fetal development.
- Complete molar pregnancy. There is an abnormal placenta and no fetus.

Both forms are due to problems during fertilization. The exact cause of fertilization problems is unknown. There are no known ways to prevent these masses from forming.

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### Symptoms

Symptoms of a molar pregnancy are:

- Abnormal growth of the uterus, either bigger or smaller than usual
- Nausea and vomiting that may be severe enough to require a hospital stay
- Vaginal bleeding during the first 3 months of pregnancy
- Symptoms of hyperthyroidism, including heat intolerance, loose stools, rapid heart rate, restlessness or nervousness, warm and moist skin, trembling hands, or unexplained weight loss
- Symptoms similar to preeclampsia that occur in the first trimester or early second trimester, including high blood pressure and swelling in the feet, ankles, and legs (this is almost always a sign of a hydatidiform mole, because preeclampsia is extremely rare this early in a normal pregnancy)

### Exams

A pelvic exam may show signs similar to a normal pregnancy.

But the size of the womb may be abnormal and there may be no heart sounds from the baby. There may be some vaginal bleeding.

A pregnancy ultrasound will show an abnormal placenta, with or without some development of a baby.

### Tests may include:

- hCG (quantitative levels) blood test
- Chest x-ray
- CT or MRI of the abdomen (imaging tests)
- Complete blood count (CBC)
- Blood clotting tests
- Kidney and liver function tests

### Treatment

If the health care provider suspects a molar pregnancy, a dilation and curettage (D & C) will most likely be recommended.

Sometimes a partial molar pregnancy can continue.

A woman may choose to continue the pregnancy in the hope of having a successful birth and delivery. However, these are very high-risk pregnancies.

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Risks include;

- bleeding,
- problems with blood pressure, and
- Problems with premature delivery (having the baby before it is fully developed).
- the condition may become worse.

A hysterectomy; surgery to remove the uterus, may be an option for older women who do not wish to become pregnant in the future.

After treatment, the hCG level will be monitored.

It is important to avoid another pregnancy and to use a reliable contraceptive for 6 to 12 months after treatment for a molar pregnancy.

This time allows for accurate testing to be sure that the abnormal tissue does not grow back. Women who get pregnant too soon after a molar pregnancy are at high risk of having another molar pregnancy.

Most hydatidiform moles are noncancerous (benign).  
Treatment is usually successful.

Close follow-up by the health care provider is important to ensure that signs of the molar pregnancy are gone and pregnancy hormone levels return to normal.

Sometimes hydatidiform moles can continue and start changing into cancer. These moles can grow deep into the uterine wall and cause bleeding or other complications.

Rarely, a hydatidiform mole develops in choriocarcinoma .

This is a fast-growing cancer. It is usually treated with chemotherapy, and can be life-threatening.

### Possible Complications

Complications of molar pregnancy may include:

- Change to invasive molar disease or choriocarcinoma
- Preeclampsia
- Thyroid problems

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- Molar pregnancy that continues or comes back

Complications from surgery to remove a molar pregnancy include:

- Excessive bleeding, possibly requiring a blood transfusion
- Side effects of anesthesia

### **Heart conditions and pregnancy**

When the pregnant women have a heart condition, they will need special attention/care during pregnancy.

–Pregnancy stresses the heart and circulatory system.

–During pregnancy, the blood volume increases by 30 to 50 % to nourish the growing fetus.

–The amount of blood that is pumped by the heart every minute also increases by 30 to 50 %.

–The heart rate also increases.

These changes cause the heart to work harder.

Labor and delivery also add to the heart's workload.

During labor;

–When the woman has to push during labor she also experiences abrupt changes in blood flow and pressure.

–When the baby is born, there is reduced blood flow through the uterus that also stresses the heart.

The risks

The risks depend on the nature and the severity of the underlying heart status/condition for example:

Heart rhythm issues

–Some minor abnormalities in heart rhythm are common during pregnancy. They are not usually cause for worry/ concern.

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### Heart valve issues

If there is an artificial heart valve or the heart or valves are malformed or scarred, there might be an increased risk of complications during the pregnancy.

–If the valves are not working well, there may be trouble tolerating the increased amount of blood flow.

–Also the artificial or abnormal valves may cause an increased risk of endocarditis (a potentially life threatening infection of the lining of the heart and heart valves).

–Mechanical artificial heart valve poses serious risks during pregnancy because there is a need to adjust use of blood thinners and the potential for life-threatening clotting/thrombosis of the heart valves.

### Congestive heart failure

–As the blood volume increases, congestive heart failure may get worse.

### Congenital heart defect

–If the woman was born with a heart problem, the baby has a greater risk of developing some type of heart defect, too.

–The woman may also be at risk of premature birth.

### **There are four valves in the heart including the:**

- Mitral,
- Tricuspid,
- Aortic and
- Pulmonic valves.

The aortic valve is located between the left ventricle (lower heart pumping chamber) and the aorta, which is the largest artery within the body.

The valves maintain one way blood flow through the heart.

Some heart conditions, such as problems with the;  
–mitral valve or aortic valve, can cause life-threatening risks for the mother and /or the baby.

Depending on the circumstances, some heart conditions may require major treatments for example heart surgery, before the women try to get pregnant.

## Eisenmenger's syndrome

The risk of pregnancy in women with Eisenmenger's syndrome is so high that pregnancy is not recommended.

High blood pressure affects the arteries in the lungs and the right side of the heart (pulmonary hypertension). Individuals with Eisenmenger's syndrome are often born with a hole between the two pumping chambers (the left and right ventricles) of the heart - ventricular septal defect. The hole allows the blood that has already picked up oxygen from the lungs to flow back into the lungs, instead of going out to the rest of the body.

Other heart defects that can lead to Eisenmenger syndrome include:

- Atrioventricular canal defect
- Atrial septal defect
- Cyanotic heart disease
- Patent ductus arteriosus
- Truncus arteriosus
- Over many years, increased blood flow can damage the small blood vessels in the lungs. This causes high blood pressure in the lungs.
- As a result, the blood backs up and does not go to the lungs to pick up oxygen. Instead, the blood goes from the right side to the left side of the heart, causing oxygen-poor blood to travel to the rest of the body.

### Symptoms

- Bluish lips, fingers, toes, and skin (cyanosis)

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- Chest pain
- Coughing up blood
- Dizziness
- Fainting
- Feeling tired
- Shortness of breath
- Stroke
- Swelling in the joints caused by too much uric acid (gout).

### **Preparing for pregnancy**

–Appointment with the cardiologist and the health care provider is vital, even before pregnancy.

–Some medications commonly used to treat heart conditions are not used during pregnancy.

–Depending on the circumstances, the health care provider might adjust the dosage or make a substitution and explain the risks involved.

### **Prenatal visits for women with Heart Condition**

–During the pregnancy, there will be frequent appointments with health care provider often.

–The weight and blood pressure will be checked at every visit,

–Frequent blood and urine tests will be completed.

The health care provider may use various tests to evaluate the heart function, such as:

### **Echocardiogram**

This test uses sound waves to produce images of the heart.

### **Electrocardiogram**

This test records the heart's electrical activity.

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### Close monitoring of the baby

The health care provider will closely monitor the baby's development throughout the pregnancy. Routine ultrasound exams can be used to track the baby's growth, and specialized ultrasounds can be used to detect any fetal heart abnormalities.

The baby may also need monitoring or treatment after delivery.

### Teach the women steps to take to prevent complications

Teach the women to take good care of themselves is the best way to take care of the baby.

For example:

Keep prenatal appointments

–Visit the health care provider regularly throughout the pregnancy.

Take medications as prescribed

–The physician will prescribe the safest medication at the most appropriate dose.

### **REST**

–Take daily naps,

–Avoid strenuous physical activities.

–Bed rest is sometimes recommended.

### Monitor weight

–Gaining the appropriate amount of weight will support the baby's growth and development, but if there is too much weight gain, it will place additional stress on the heart.

### Manage anxiety

–Teach patients what to expect during labor and delivery.

–Knowing what is happening can help the women feel more relaxed.

### **Know what to avoid;**

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–Avoid smoking,

–Avoid alcohol

–Avoid illegal drugs.

Signs or symptoms to report to the physician

Contact the physician/ health care provider for any abnormal signs or symptoms, such as:

- Difficulty with breathing
- Shortness of breath on exertion
- Heart palpitations,
- Rapid heart rate
- Irregular pulse
- Chest pain
- Cough with blood

### **Labor and delivery**

–The physician may recommend delivering the baby at a medical center that specializes in high-risk pregnancies.

–Labor may be induced if there are concerns about the heart or circulation

–Certain specialists may be present during labor

–Specialized equipment might be used to monitor the woman and baby during labor.

If the heart condition places the woman at high risk, a catheter might be inserted into a vein or artery to provide detailed information about the heart function and blood pressure.

The contractions and the baby's heart rate will continuously be monitored.

Side lying position

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Instead of lying flat on the back, the woman might be asked to lie on the side and draw one of the knees toward the chest.

To reduce stress on the respiratory system,

–Epidural anesthesia may be prescribed for pain relief.

If a vaginal delivery, the health care provider

–might limit the amount of time the woman should push.

The baby may be delivered with the help of forceps or a vacuum extractor.

If the woman is at risk of endocarditis,

–she might receive antibiotic treatment just before and after delivery.

### Breast-feeding

Breast-feeding is encouraged for most women who have heart conditions, even those who take medication. Sometimes alternative medication is recommended.

If the woman has a congenital heart problem that greatly increases the risk of endocarditis, the physician will discuss the risk of mastitis while breast-feeding.

## Mastitis

Mastitis is a breast inflammation usually caused by infection.

Going for long periods between nursing and/ or not emptying the breast completely can also contribute to mastitis.

Using different breast-feeding techniques and making sure the baby is latched on properly when nursing will help with emptying the breast and avoiding cracked nipples.

Mastitis can be painful; it is usually easily cleared up with medication.

Mastitis often starts as a painful area in one breast. It may be red or warm to the touch, or both.

There might also be;

–fever,

– chills, and

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–body aches.

### Treatment

- Antibiotics as ordered by the physician
- Take acetaminophen/ Tylenol for pain or a fever.
- Get more rest,
- Drink more fluids,
- Use warm or cold packs on the painful breast
- Before breast feeding the baby, place a warm, wet washcloth over the affected breast for about 15 minutes (at least 3 times a day). This will increase milk flow in the breast. Also massaging the affected breast may increase milk flow.

Pumping and feeding breast milk might be recommended in some circumstances.

## **Pregnancy and diabetes**

There are many risks to having diabetes during pregnancy. Complications are more likely when the blood sugar is not well controlled. With good control, most pregnancies have good outcomes. Therefore dietary management will be the priority of the treatment plan.

Pregnant women with gestational diabetes tend to have larger babies at birth. This can increase the chance of problems at the time of delivery.

Possible problem that may be encountered include birth injury because of the baby's large size.

### **The goals include:**

- Tight blood sugar control  
When the woman has diabetes (type 1 or type 2 ) pregnancy will present challenges.
- Complications are more likely when the blood sugar is not well controlled.  
Therefore the goal is good control.

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- Pregnant women with gestational diabetes tend to have larger babies.  
Leading to possibility of problems at the time of delivery which may include;
- Injury at birth due to the baby's large size
- Delivery by C-section
- The baby may experience periods of hypoglycemia during the first few days of life.

–Women with gestational diabetes have an increased risk for hypertension (increase blood pressure) during pregnancy.

After delivery:

- The women high blood glucose levels goes back to normal levels.
  - Close monitoring is needed to check for signs of diabetes.
- The diabetes health care team may include
- an endocrinologist or other diabetes specialist,
  - a diabetes educator
  - a registered dietitian.

As the pregnancy progresses, the health care team will help to manage the blood sugar level and adjust the diabetes treatment plan that the women need.

During pregnancy, the woman may need to consult other specialists, such as:

An obstetrician

–An obstetrician is needed to handle the high-risk pregnancy. The obstetrician will carefully monitor the health of the women and the baby throughout the pregnancy.

An eye specialist

–An eye specialist can monitor diabetes related injury/ damage to small blood vessels within the eyes, which can progress during pregnancy.

A pediatrician

–It is also recommended that the women should establish a relationship with the physician who will care for the baby after birth.

Controlling the blood sugar level before and during pregnancy is the best way to prevent diabetes complications.

Good blood sugar control during pregnancy can:

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Reduce the risk of stillbirth and miscarriage;  
Good blood sugar control reduces the risk of stillbirth and miscarriage  
Reduce the risk of premature delivery/birth

The better the blood glucose control, the less likely the women will go into preterm labor.

Reduce the risk of birth defects

Good blood sugar control during early pregnancy greatly reduces the baby's risk of birth defects, especially those affecting the;

- Brain,
- Spine,
- Heart.

Reduce the risk of excess fetal growth

With poor blood sugar control, extra glucose will cross the placenta.  
This therefore triggers the baby's pancreas to make extra insulin, which can cause the baby to grow too large -macrosomia.

Fetal macrosomia - birth weight of 4000-4500 g (8 lb 13 oz to 9 lb 15 oz).  
A large baby makes vaginal delivery difficult and puts the baby at risk of injury during birth.

### **Prevent complications for mom;**

Good blood glucose control reduces the risk of high blood pressure, preeclampsia (high blood pressure that begins after 20 weeks of pregnancy) and other potentially serious pregnancy complications.

### **Prevent complications for baby;**

Sometimes the baby (whose mother had diabetes) develops low blood glucose-hypoglycemia shortly after birth due to their own insulin production is too high.

The women should;

- follow the target blood glucose range given by the physician/ diabetes team.
- follow the diabetes treatment plan.

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–Check their blood sugar level often. Frequently monitoring blood sugar (at least three times a day) can help prevent low blood sugar (hypoglycemia) and high blood sugar (hyperglycemia).

–Sometimes the women may need to adjust the insulin dosage depending on the blood sugar level, what they are eating, whether they are vomiting and other factors. The stage of pregnancy also matters.

–During the last three months of pregnancy, hormones made by the placenta to help the baby grow can also block the effect of insulin in the body. Therefore the women may need more insulin than usual to counteract that resistance.

–Take insulin or other medications as ordered. Although oral diabetes medications are sometimes used during pregnancy, the physician/ health care provider may recommend switching to insulin.

### **ALERT!!**

Some medications including certain drugs to treat high blood pressure, such as ACE inhibitors should not be taken during pregnancy.

### Eating healthy

The diabetes diet usually includes;

- fruits,
- vegetables,
- whole grains

The physician/ healthcare provider and/ or registered dietitian may suggest changes to the meal plan to help avoid problems with low blood glucose or high blood glucose.

It is also important to take prenatal vitamins containing folic acid.

Include exercise /physical activity in the daily routine

- Obtain the physician’s approval to exercise
- At least 150 minutes a week of moderate aerobic activity.
- start off slowly.

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- Check the blood glucose level before and after any activity, especially if taking insulin.
  - Possibly need to eat a snack or adjust insulin pump's basal rate before exercising to prevent low blood sugar.
- Follow up with the regular prenatal schedule

The physician/ healthcare provider might recommend regular ultrasounds or other prenatal screening tests to monitor the baby's growth and development.

### **Labor and delivery for the women with Diabetes**

The physician/ healthcare team will help the women determine the best time and safest way to deliver the baby.

- Sometimes labor is allowed to begin naturally and
  - other times labor may need to be induced early to reduce the risk of complications.
- During labor, the healthcare team will monitor the blood glucose level and adjust the insulin dosage accordingly.

Sometime the women may need a C-section if;

- the baby is too large,
- an induction is not successful or
- the women develop complications.

Educate the women that after the delivery of the baby;

- It is still very important to take care of themselves
- Continue to check the blood sugar level often, especially if breast feeding.

### **Anemia during pregnancy**

Anemia during pregnancy can make the women;

- feel weak and tired.  
When pregnant, there is an increased risk of iron deficiency anemia, a condition in which the women do not have enough healthy red blood cells (RBC) to carry adequate oxygen to the tissues.

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The body uses iron to make hemoglobin (a protein in the red blood cells that carries oxygen to the tissues).

–During pregnancy, the blood volume expands to accommodate changes in the body and to help the baby make his or her entire blood supply which doubles the need for iron.

–If the women do not have enough iron stores or do not get enough iron during the pregnancy, they could develop iron deficiency anemia.

Anemia may affect the baby;

Iron deficiency anemia during pregnancy;

- May increase the risk of a preterm delivery
- Low birth weight.

Increased risk of developing anemia during pregnancy occurs if:

- Have two or more closely spaced pregnancies
- Pregnant with more than one baby
- Vomiting frequently due to morning sickness
- Do not consume enough iron
- Had a heavy pre-pregnancy menstrual flow

Symptoms of anemia during pregnancy

With mild case of iron deficiency anemia, the women may not notice any symptoms. However, if they have a moderate or severe case, they may:

- Be excessively tired and weak
  
- Become increasingly pale
  
- Have heart palpitations
- 
- Be short of breath
- 
- Feel dizzy or lightheaded
- 
- Have cravings to eat nonfood items (pica), such as clay or cornstarch

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A blood test to screen for anemia is usually done;

- During the first prenatal visit and
- once more during the course of the pregnancy.

Prenatal vitamins

- Prenatal vitamins have iron.

–Taking a prenatal vitamin that contains iron can help prevent and treat anemia during pregnancy.

–In some cases, the physicians/ health care provider might recommend a separate iron supplement.

–During pregnancy, the women need 27 milligrams (mg) of iron per day.

–Pregnant women need 400 to 800 mcg or micrograms of folic acid every day, even if they are not planning to get pregnant. (0.4 to 0.8 mg) to prevent birth defects (Brain, spinal cord)

### **Good nutrition can help to prevent anemia during pregnancy.**

Dietary sources of iron include;

- lean red meat,
- poultry
- Fish
- Iron-fortified breakfast cereals,
- Beans and vegetables.

The iron from animal products, for example meat, is most easily absorbed.

To enhance the absorption of iron from plant sources and supplements, pair them with a food or drink high in vitamin C for example;

- orange juice,
- tomato juice or
- Strawberries.

If taking iron supplements with orange juice, avoid the calcium-fortified juice.

–Calcium is an essential nutrient during pregnancy, however calcium can decrease iron absorption.

## Treating anemia during pregnancy

If prenatal vitamin that contains iron is in progress and the woman is still anemic, the physician/ health care provider may recommend testing to determine other possible causes.

In some cases, the women may need to see a hematologist (physician who specialize in treating blood disorders).

If the cause is iron deficiency, additional supplemental iron may be suggested.

If there is a history of gastric or small bowel surgery or are unable to tolerate oral iron, the women may need intravenous iron administration.

## ECTOPIC PREGNANCY

An ectopic pregnancy occurs when a fertilized egg implants somewhere other than the main cavity of the uterus.

As mentioned earlier, pregnancy begins with a fertilized egg. Under normal circumstances, the fertilized egg attaches itself to the lining of the uterus.

—An ectopic pregnancy most often occurs in one of the fallopian tubes (tubes that carry eggs from the ovaries to the uterus).

This type of ectopic pregnancy is known as a tubal pregnancy.

Sometimes, an ectopic pregnancy may occur in the ovary or neck of the uterus (cervix). An ectopic pregnancy cannot proceed normally.

The fertilized egg cannot survive, and the growing tissue might destroy various maternal structures.

If left untreated, life-threatening blood loss may occur.

Early treatment of an ectopic pregnancy may help preserve the chance for future

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healthy pregnancies.

### SYMPTOMS

In the early stage, an ectopic pregnancy may not cause any signs or symptoms or early signs and symptoms of an ectopic pregnancy may be the same as those of any pregnancy;

- Missed period,
- Breast tenderness
- Nausea
- Positive pregnancy test

The first warning sign of an ectopic pregnancy is usually;

- Light vaginal bleeding
- with abdominal pain or pelvic pain

If blood leaks from the fallopian tube, it is also possible to feel shoulder pain or an urge to have a bowel movement (depends on where the blood pools or which nerves are irritated).

If the fallopian tube ruptures, there is often heavy bleeding within the abdomen followed by;

- lightheadedness,
- fainting and
- shock.

### ALERT!!

Teach the women to seek emergency medical help if experiencing any signs or symptoms of an ectopic pregnancy, including:

- Severe abdominal pain with vaginal bleeding
- pelvic pain with vaginal bleeding
- Extreme lightheadedness
- fainting
- Shoulder pain

\*Shoulder pain - It is caused by internal bleeding irritating the diaphragm.

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Some causes of ectopic pregnancy

A tubal pregnancy (the most common type of ectopic pregnancy) occurs when a fertilized egg gets lodged on its way to the uterus, often because;

–the fallopian tube is damaged by inflammation or is misshapen.

–Hormonal imbalances or abnormal development of the fertilized egg also might play a role.

### RISK FACTORS

Up to an estimated 20 in every 1,000 pregnancies are ectopic. Various factors are associated with ectopic pregnancy, including:

Previous ectopic pregnancy

–If the women had previous ectopic pregnancy, they are more likely to have another.

Inflammation or infection

–Inflammation of the fallopian tube (salpingitis)

– an infection of the uterus,

–fallopian tubes or ovaries (pelvic inflammatory disease) increases the risk of ectopic pregnancy (these infections are often caused by gonorrhea or Chlamydia).

Fertility issues

Some research suggests an association between;

–Difficulties with fertility; as well as use of fertility drugs, and ectopic pregnancy.

Structural concerns

An ectopic pregnancy is more likely if;

–the woman has an unusually shaped fallopian tube or

– the fallopian tube was damaged, for example during surgery.

Contraceptive choice

Pregnancy when using an intrauterine device (IUD) is rare.

However If pregnancy occurs, it is more likely to be ectopic.

Also for pregnancy after tubal ligation (having tubes tied). Although pregnancy after tubal ligation is rare, if it happens, it is more likely to be ectopic.

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### Smoking

–Cigarette smoking just before becoming pregnant can increase the risk of an ectopic pregnancy. And the more the woman smokes, the greater the risk.

With an ectopic pregnancy, without treatment, a ruptured fallopian tube could lead to life-threatening bleeding.

### Tests

When the physician suspects an ectopic pregnancy, a pelvic exam will be done to check for ;

- pain,
- tenderness,
- a mass in the fallopian tube or ovary.

However the physical exam alone usually is not enough to diagnose an ectopic pregnancy. The diagnosis is typically confirmed with imaging studies, for example an ultrasound and blood tests.

–With a standard ultrasound, high-frequency sound waves are directed at the tissues in the abdominal area.

–During early pregnancy, the uterus and fallopian tubes are closer to the vagina than to the abdominal surface. The ultrasound will likely be done using a wand like device placed in the vagina (transvaginal ultrasound).

Sometimes it is too early to detect a pregnancy through ultrasound.

If the diagnosis is in question, the physician may monitor the women condition with blood tests until the ectopic pregnancy can be confirmed or ruled out through ultrasound (by four to five weeks after conception).

In an emergency situation such as with heavy bleeding; an ectopic pregnancy might be diagnosed and treated surgically.

### Treatments

A fertilized egg cannot develop normally outside the uterus.

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To prevent life threatening complications, the ectopic tissue needs to be removed.  
If the ectopic pregnancy is detected early,

—an injection of the drug methotrexate is sometimes used to stop cell growth and dissolve existing cells.

But the diagnosis of ectopic pregnancy must be verified before this treatment is administered.

Monitor Human chorionic gonadotropin (HCG)

After the injection, the physician/ healthcare provider will monitor the blood for the pregnancy hormone human chorionic gonadotropin (HCG).

If the HCG level remains high, the woman may need another injection of methotrexate.

Ectopic pregnancy;

—May be treated with laparoscopic surgery.

In the procedure, a small incision is made in the abdomen, near or in the navel.

The physician then uses a thin tube equipped with a camera lens and light (laparoscope) to look at the area.

Other equipment/ instruments may be inserted into the tube or through other small incisions;

—to remove the ectopic tissue and repair the fallopian tube.

If the fallopian tube is damaged, it may also need to be removed.

If the ectopic pregnancy is causing heavy bleeding or the fallopian tube has ruptured,

—the woman may need emergency surgery through a laparotomy (an abdominal incision).

—Sometimes the fallopian tube can be repaired however; a ruptured tube has to be removed.

The physician will monitor the HCG levels after surgery to be sure all of the ectopic tissue has been removed.

If HCG levels does not come down quickly,  
an injection of methotrexate may be given.

## UTERINE FIBROIDS

Uterine fibroids are noncancerous growths of the uterus that often appear during childbearing years.

—Also known as leiomyomas or myomas, uterine fibroids are not associated with an increased risk of uterine cancer and almost never develop into cancer.

Uterine fibroids develop from;

—myometrium (smooth muscular tissue of the uterus).

A single cell divides repeatedly, and creates a firm, rubber like mass that is distinct from nearby tissue.

The growth patterns of uterine fibroids vary,

—sometimes they grow slowly or rapidly, or

— they may remain the same size.

—Some fibroids go through growth spurts, some shrink on their own.

—Some fibroids present during pregnancy disappear or shrink after pregnancy, as uterus goes back to normal size.

Fibroids range in size;

—Small -seedlings, undetectable by the human eye, or

—large bulky masses that can enlarge the uterus

—They can be single,

—They can be multiple,

—in extreme cases they can expand the uterus (until it reaches the rib cage).

As many as 3 out of 4 women have uterine fibroids, but most are unaware of them because they often have no symptoms.

The physician may discover fibroids during;

—a pelvic exam or

—Prenatal ultrasound.

### Symptoms

Some of the most common symptoms of uterine fibroids include:

- Heavy menstrual bleeding
- Prolonged menstrual periods (menstrual bleeding for 7 days or more)
- Pelvic pressure
- Pelvic pain
- Frequent urination

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- Difficulty emptying the bladder
- Constipation
- Backache
- leg pains

–Sometimes the fibroid may cause acute pain when it outgrows the blood supply, less blood supply means less nutrients

–the fibroid begins to die; may experience pain and fever.

Fibroid location, Fibroid size and number of Fibroid influence signs and symptoms.

**Pedunculated fibroid** - a fibroid that hangs by a stalk inside or outside the uterus can trigger pain by twisting on its stalk and cut off the blood supply.

### **Submucosal fibroids-**

Fibroids grow into the inner cavity of the uterus ; more likely to cause

- Prolonged menstrual bleeding,
- heavy menstrual bleeding and
- sometimes a problem for the women who are attempting pregnancy.

### **Subserosal fibroids –**

Fibroids that project to the outside of the uterus.

- They may press on the urinary bladder and cause urinary symptoms.
- If fibroids bulge from the back of the uterus;
- they can press either on the rectum, causing a pressure sensation, or
- press on the spinal nerves, resulting in back pain/ache.

**Intramural fibroids-** Fibroids that grow within the muscular uterine wall.

- If massive, they can enlarge the uterus
- or alter the shape of the uterus and
- cause heavy periods or
- prolonged periods;
- they can cause pressure and pain.

Pedunculated fibroid - a fibroid that hangs inside or outside the uterus

Submucosal fibroids- Fibroids grow into the inner cavity of the uterus

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Subserosal fibroids – Fibroids that project to the outside of the uterus.

Intramural fibroids- Fibroids that grow within the muscular uterine wall.

Teach the women to follow up with the physician when;

Excessive heavy menstrual flow

Very painful periods

Persistent pelvic pain

Spotting between periods

Bleeding between periods

Persistent pain with intercourse

Enlarged uterus

Enlarged abdomen

Difficulty emptying the bladder

### **ALERT!!!**

Teach the women that for severe vaginal bleeding and /or sudden sharp pelvic pain  
FOLLOW UP WITH PHYSICIAN.

Causes of uterine fibroids

Research and clinical experience point to some factors such as:

Genetic changes

Some fibroids show changes in genes that are different from those within the normal uterine muscle cells.

There is also evidence that identical twins are more likely to both have fibroids than nonidentical twins (runs in the family).

### **Hormones**

Estrogen and progesterone the hormones that stimulate development of the uterine lining during each menstrual cycle in preparation for pregnancy appear to play a role.

–Estrogen and progesterone appear to promote the growth of fibroids.

–Fibroids contain more estrogen and progesterone receptors than normal uterine muscle cells.

–Fibroids often shrink after menopause due to a reduction in hormone production.

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### Other growth substances

Other substances which help the body to maintain the tissues, for example insulin-like growth factor, may also affect the growth of fibroid.

### Risk factors

Some risk factors for uterine fibroids development include;

–Being a woman of reproductive age.

–Heredity; If the mother or sister had fibroids, then the woman is at increased risk of developing fibroids.

–Race; black women are more likely to have fibroids than women of other racial groups. Also black women tend to have fibroids at a younger age, and also likely to have more fibroids or larger fibroids.

–Onset of menstruation at an early age, tend to develop fibroids

–Having a diet higher in red meat and lower in green vegetables and fruit, tend to develop fibroids

–Drinking alcohol and beer, appear to increase the risk of developing fibroids.

### Complications

–Uterine fibroids can cause pain/ discomfort and can lead to complications for example anemia from heavy /prolong blood loss.

### Pregnancy and fibroids

Fibroids may cause;

–infertility or

–pregnancy loss.

Submucosal fibroids can prevent implantation and also growth of the embryo. The physicians often recommend removing these fibroids before attempting pregnancy.

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### DIAGNOSIS

Uterine fibroids are often found during a routine pelvic exam.

The physician may palpate the irregularities in the shape of the uterus, (presence of fibroids).

### TREATING FIBROIDS DURING PREGNANCY

Painful fibroids are usually treated with bed rest, ice packs, and sometimes medication when needed. The physician will recommend the treatment that is safest for the women and the baby. Symptoms usually subside within a few days.

Fibroids sometimes grow larger during pregnancy, due in part to pregnancy hormones. For reasons that are not well known, a fibroid may also get smaller during pregnancy. The physician may recommend ultrasound examinations to see whether the fibroid is growing or likely to cause complications.

### Pain Management

Fibroid pain during pregnancy is usually managed conservatively by:

- bed rest,
- Hydration, and
- Analgesics.

Prostaglandin synthase inhibitors for example, nonsteroidal anti-inflammatory drugs; should be used with caution, especially for prolonged use more than 48 hours in the third trimester; often associated with fetal adverse effects and neonatal adverse effects, including:

- Premature closure of the fetal ductus arteriosus,
- pulmonary hypertension,
- necrotizing enterocolitis,
- intracranial hemorrhage,
- oligohydramnios.

Rarely, severe pain may need additional pain medication such as;

- narcotic analgesia,
- epidural analgesia,
- surgical management (myomectomy)

Myomectomy

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Prior to pregnancy, myomectomy can be considered in women with recurrent pregnancy loss or infertility however, it remains unclear whether the surgical interventions cause any improvement regarding perinatal outcome and fertility rate.

It is not common for fibroids to be surgically treated in the first half of pregnancy.

However studies have been completed with reports that antepartum myomectomy may be safely performed in the 1st and 2nd trimester of pregnancy if necessary.

Some acceptable indications include:

- Intractable pain caused by a degenerating fibroid
- Fibroid that is subserosal or pedunculated causing pain,
- A rapidly growing or large fibroid, or
- Large fibroids that are 5 cm, in the lower part of the uterus.

Due to the concerns regarding uterine rupture, the women who completed a myomectomy during pregnancy are more likely to have a cesarean section at delivery.

### **ANALGESICS**

There are two main categories of analgesics that are frequently used which include:

- Systemic nonopioid analgesics such as acetaminophen, aspirin, (nonsteroidal anti-inflammatory drugs) referred to as NSAIDs and
- Opioid analgesics such as codeine, morphine, meperidine.

Although some medications are considered safe to take during pregnancy, the effects of other medications on the unborn baby are unknown.

### **Educate the pregnant women**

If they are taking prescription medications before pregnancy, instruct them that as soon as they are aware that they are pregnant to discuss this with the physician regarding the safety of continuing these medications.

The physician will look at the benefits to the woman and the risk to the baby when making recommendations.

With some medications, the risk associated with not taking them can be more

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detrimental than the risk that is associated with taking the medications.  
No medication can ever be considered 100% safe to use when pregnant!!!

### **The U.S. Food and Drug Administration (FDA)**

The U.S. Food and Drug Administration (FDA) is aware of the concerns arising from recent reports questioning the safety of over-the-counter (OTC) and prescription pain medications when used during pregnancy.

Because of this uncertainty, the use of pain medications during pregnancy should be carefully considered.

The U.S. Food and Drug Administration (FDA) urge pregnant women to always discuss all medications with the physician/ health care professionals before taking them.

Severe and persistent pain that is not effectively treated during pregnancy can result in high blood pressure, anxiety, depression etc. in the mother.

Medications such as acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and opioids can help to treat severe and persistent pain. However, it is very important to carefully weigh the benefits and the risks of using prescription and OTC pain medications during pregnancy.

The potential risks associated with the following three types of pain medications ;

#### 1. Prescription NSAIDs and the risk of miscarriage in the first half of pregnancy.

Examples of prescription NSAIDs ; ibuprofen, naproxen, diclofenac, and celecoxib.

#### 2. Opioids (available only by prescription), and the risk of birth defects of the brain, spine, or spinal cord in babies born to women who took these products during the first trimester of pregnancy.

Examples of opioids include oxycodone, hydrocodone, hydromorphone, morphine, and codeine.

#### 3. Acetaminophen in both over-the-counter and prescription products and the risk of attention deficit hyperactivity disorder (ADHD) in children born to women who took this medication at any time during pregnancy.

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Acetaminophen is a common pain medication and fever reducer that is found in several medications including those used for colds, flu, allergies, and sleep.

\*Pregnant women should always consult with the physician/ health care professional before taking any prescription or over-the-counter medication.

Women taking pain medications who are considering becoming pregnant should also consult with the physician/health care professionals to discuss the risks and benefits of pain medication use.

The physician/ health care professionals should also continue to follow the recommendations in the drug labels whenever they are prescribing pain medications to the pregnant patients.

### **Acetaminophen**

—Acetaminophen, a nonsalicylate that is similar to aspirin in analgesic potency, has demonstrated efficacy at all stages of pregnancy in standard therapeutic doses.

—Acetaminophen is an active ingredient in hundreds of over-the-counter and prescription medications. It relieves fever and pain.

—Acetaminophen is also available in combination with other active ingredients in medications that treat cough, allergy, colds, flu, and insomnia.

—In prescription medications, acetaminophen/Tylenol is combined with other active ingredients to treat moderate to severe pain.

Acetaminophen can cause serious liver damage if amount more than directed is used.

### **Aspirin**

—Aspirin has potential risks; it inhibits platelet function and therefore can contribute to maternal bleeding and fetal bleeding.

Nonsteroidal anti-inflammatory drugs

—Nonsteroidal anti-inflammatory drugs (NSAIDs) are available by prescription and over-

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the-counter (OTC).

–Nonsteroidal anti-inflammatory drugs are used to relieve fever and pain, for example those associated with headaches, flu, colds and arthritis.

Examples of some prescription NSAIDs include:

–Ibuprofen,

–Naproxen,

–Diclofenac, and

–Celebrex (celecoxib)

(Ibuprofen and naproxen are also available over-the-counter at lower strengths).

### Opioids

Opioids are powerful prescribed medications that can help to manage pain. When they are prescribed and used improperly they can cause serious harm, such as overdose and/ or death.

Some of these agents include;

–Morphine like agonists such as; morphine, codeine, hydromorphone, oxycodone, and hydrocodone

– meperidine like agonists, and

–synthetic opioid analogues such as tramadol.

### Medications during pregnancy

Medications for Allergy:

Antihistamines such as;

Chlorpheniramine;

–Chlor-Trimeton,

–Efidac,

–Teldrin

Chlorpheniramine is in a class of medications called antihistamines and works by blocking the action of histamine (substance in the body which causes allergic symptoms).

Chlorpheniramine helps to control the symptoms of allergies or cold. It helps to;

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- Relieve itchy, red, watery eyes;
- Relieve sneezing, itchy throat or itchy nose and runny nose that is caused by allergies, hay fever, and the cold.

Loratadine;

- Alavert,
- Claritin,
- Loradamed,
- Tavist ND Allergy

Diphenhydramine;

- Benadryl

Diphenhydramine (Benadryl) is an antihistamine. It reduces the effects of histamine in the body. Histamine can produce symptoms such as itching, sneezing, runny nose and watery eyes and other cold or allergy symptoms.

For constipation

Colace

Fiberall/Fibercon

Metamucil

Citrucil

Senekot

Milk of Magnesia (Magnesium hydroxide).

Milk of Magnesia is;

- used for a short time to treat occasional constipation.
- It is a laxative; osmotic-type that is thought to work by drawing water into the intestines, which helps to cause movement of the intestines.
- also used to treat symptoms caused by too much stomach acid for example upset stomach, heartburn, indigestion etc.
- an antacid that works by lowering the amount of acid in the stomach.

**Side Effects may occur such as;**

Diarrhea may occur

High magnesium levels

Dehydration

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Stomach pain  
Abdominal pain,  
Bloody stools,  
Rectal bleeding

### **ALERT!!!**

Symptoms of ELEVATED magnesium levels may include:

- muscle weakness,
- slow/irregular heartbeat,
- slow/shallow breathing,
- mental changes /mood changes for example confusion

Some symptoms of dehydration may occur, such as:

- Decreased urination,
- dizziness,
- extreme thirst,
- very dry mouth

For cold and Flu

Robitussin,  
Romilar,  
Trind-DM,  
Vicks Cough Syrup  
Actifed,  
Dristan,  
Sudafed  
Tylenol /acetaminophen or Tylenol Cold  
Warm salt (water gargle)  
Saline nasal spray or drops

For First Aid ointment

Bacitracin  
J & J  
Neosporin

For Nausea and Vomiting

Emetrex

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Emetrol (if the woman is not diabetic)

Sea bands

Vitamin B6 (100 mg tablet)

For pain such as headache

Tylenol (acetaminophen)

For Diarrhea – Take only after 12 weeks of pregnancy

Imodium

Kaopectate

Parepectolin

For Heartburn

Gaviscon

Maalox

Mylanta

Riopan

Titralac

TUMs

For yeast infection

Monistat or

Terazol

Instruct the women not to insert the applicator too far.

For Hemorrhoids

Anusol

Preparation H

Tucks

Witch hazel

For Rashes

Benadryl cream

Caladryl lotion or cream

Hydrocortisone cream or ointment

Oatmeal bath (Aveeno)

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ALERT!!! – the use of NATURAL products

–Some pregnant women believe that natural substances can be used safely to relieve some symptoms of pregnancy such as nausea, backache, and other symptoms but many of the natural products have not been tested for safety and effectiveness in pregnant women.

### **Pain relief during labor:**

- Epidurals are most effective,
- Immersion in a warm bath,
- a high tech nerve stimulator (TENS unit).
- Relaxation techniques,
- Patterned breathing,
- Emotional support, and
- self-hypnosis (alternative therapies).

### **TERATOGEN**

A teratogen is an agent or factor that causes the production of physical defects in the developing fetus. Many drugs are known to have teratogenic effects on the fetus if taken during pregnancy.

Drugs are the most widely recognized cause of structural defects in the developing fetus.

Examples of known effects:

Physical abnormalities (no arms or legs).

Hemorrhage or jaundice.

Neurologic symptoms.

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Abnormal dental pigmentation.

Addiction.

Vaginal malignancy or altered sperm causing infertility.

### **Teratogenic Examples**

(1) Thalidomide-used in England in the 1950's and 1960's as a sedative.

(2) Phenytoin/ Dilantin -used for seizures.

(3) Methotrexate -used to treat neoplastic diseases.

(4) Diethylstilbestrol -used for vasomotor symptoms during menopause.

(5) Accutane --used to treat cystic acne.

### **Teratogenic viruses and parasites;**

Herpes simplex.

Rubella (German measles).

Toxoplasmosis (transmitted by cat feces or raw meat).

Influenza or viral infections in the early weeks of pregnancy.

Other teratogenic conditions;

Hyperthermia.

Maternal disease (diabetes).

Maternal malnutrition.

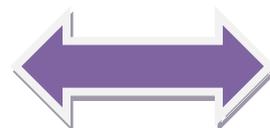
X-rays should be avoided (radiation from the x-rays can cause deformity of the fetuses if exposed in the first trimester).

Environmental pollutants

Lead

Increase in maternal age.

Tobacco and alcohol.



## LABOR AND DELIVERY

### INDUCING LABOR

The physician/ health care provider may recommend inducing labor for several reasons, especially when there is concern for the women health or the health of the baby.

Some reasons why labor may be induced include:

- The woman is approaching 2 weeks beyond the due date, and labor has not started naturally.
- There is an infection in the uterus
- The water has broken, but there is no contractions
- There may be medical conditions present that may put the women or the baby at risk, such as high blood pressure or diabetes.
- The baby has stopped growing (at expected pace)
- Oligohydramnios present (not enough amniotic fluid surrounding the baby).
- The placenta pulls away from the wall of the uterus before delivery (completely or partially)-placental abruption.

### Waiting for labor to begin

If the health care provider is concerned about the health or the baby's health or the pregnancy continues two weeks past the due date, inducing labor might be the best option.

Concerns after two weeks

- The longer the pregnancy continues, the larger the baby is likely to be which may complicate a vaginal delivery.
- The aging of the placenta might compromise a baby's ability to thrive in the womb.
- An overdue baby is also more likely to inhale fecal waste (meconium) during delivery, which can cause breathing problems or a lung infection after birth.

### INDUCTION

The health care provider will confirm that the baby's gestational age is at least 39 weeks or older before induction to reduce the risk of health problems for the baby.

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Inducing labor has various risks, including:

- The need for a C-section. Labor induction is more likely to result in the need for a C-section if the cervix has not already begun to thin, soften and dilate. The risk of a C-section with induction is also higher if this is the first baby.
- Premature birth. Inducing labor too early might result in a premature birth, which poses risks for the baby, such as difficulty breathing.
- Low heart rate. The medications used to induce labor; oxytocin or a prostaglandin, might provoke too many contractions, which can diminish the baby's oxygen supply and lower the baby's heart rate.
- Infection- Some methods of labor induction, such as stripping or sweeping the membranes, breaking water, or placing a balloon catheter or seaweed rods into the cervix, might increase the risk of infection for both mother and baby.
- Umbilical cord problems. Inducing labor increases the risk of the umbilical cord slipping into the vagina before delivery (umbilical cord prolapse), which might compress the cord and decrease the baby's oxygen supply.
- Uterine rupture- a rare but serious complication in which the baby breaks through the wall of the uterus into the mother's abdominal cavity (occur in women who have a scarred uterus).

An emergency C-section is needed to prevent life-threatening complications.

- Bleeding after delivery. Labor induction increases the risk that the uterine muscles will not contract properly after giving birth (uterine atony), which can lead to serious bleeding after delivery.

### **Signs of Approaching Labor**

Signs of approaching labor are taught to every patients.

When the patient notices them, she is aware that labor will be forthcoming.

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The signs are:

### **Lightening-**

Descent of the fetus into the brim of the pelvis. Lightening occurs in the last 10 to 14 days of pregnancy in a primigravida. It may not occur until actual onset of labor in multigravidas (patient is able to breathe easier at this time).

### **False labor (Braxton-Hicks Contractions)-**

This is intermittent uterine contractions occurring at irregular intervals, which serve to tone the uterus.

### **Show -**

The blood-tinged mucoid vaginal discharge becomes more pronounced and red as cervical dilatation increases during labor.

### **Burst of energy**

An increase in energy level. It occurs approximately 24 hours before onset of labor. The patient should be advised to relax during this time since labor will be starting soon.

### **Rupture of membranes**

Sometimes may be the first sign. Due to the risk of the prolapse cord, the patient needs to be aware that she should go to the hospital immediately even if not having contractions. If the membranes rupture prematurely, it then becomes a complication.

### **Frequent urination**

Problem in the last stages of pregnancy. Pressure on the bladder is due to the enlarging uterus and the head settling back into the pelvis.

## LABOR

SOME THINGS TO LOOK FOR:

### Having Contractions

The uterus tightens and relaxes as it gets ready to push out the baby. That causes pain that at first feels like cramps during a period. The pain gets stronger as delivery gets closer.

If the contractions get stronger, more regular, and come closer together, it is most likely labor is starting.

If the contractions are not regular and go away with changes in positions, this might be Braxton Hicks contractions (these are not labor pains).

True contractions keep coming and steadily get stronger and closer together. They last about 30 seconds to 70 seconds.

### Back Ache

It is common to have back pain during pregnancy. It could be due to the extra strain on the back and belly muscles or just changes in posture. Heat or cold packs or massage often help.

During labor, lower back pain and cramps can also be part of the contractions. The pain often starts in the back and then moves around to the front of the body.

### Water Break

The baby is growing in a bag of protective fluid (amniotic sac). The bag breaks when it is time for the baby to be born.

However, the women can still be in labor even if the water has not broken. Sometimes the physician will have to break it with a small equipment. This helps speed up or induce the labor.

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### **Jelly-Like Discharge**

The plug of mucus blocks the cervix; As the cervix gets softer and bigger to prepare for labor, this plug loosens and drops out. It is usually a small amount of pinkish or brown-colored jelly-like discharge. It may come away in one piece or several little blobs. This can also happen before active labor.

### **Dilated and Effaced**

To stretch enough to make room for the baby, the cervix has to thin out (effaced) and get bigger or the cervix is dilated (opened), that's what she means. The cervix has to be dilated at least 10 centimeters before start pushing to deliver the baby.

### **Pregnancy labor happens in:**

3 stages and lasts on average 12 to 24 hours for a first birth.

Usually, labor is shorter for subsequent births.

### **First Stage**

Time from the onset of labor until complete cervical dilation

2 phases:

1. Latent Phase: characterized by mild, infrequent, irregular contractions with gradual change in cervical dilation (1cm per hour) and effacement. The average duration of latent phase in nulliparous and multiparous women is 6.4 and 4.8 hours, respectively. An abnormally long latent phase is defined as 20 hours for the nullipara and 14 hours for the multiparous woman.

2. Active Phase: rapid change in the rate (slope) of cervical dilation occurs at 3 to 4 centimeters. Average duration of active labor (onset defined as 3 cm dilation) in nulliparous and parous women was 6.4 and 4.6 hours, respectively

Active Labor: diagnosed in the presence of regular, painful contractions plus at least on of the following elements:

- Complete effacement of the cervix
- Progressive cervical change
- Bloody Show
- Ruptured membranes

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- Make sure all consents are signed.

### **Second Stage**

Time from complete cervical dilation to expulsion of the fetus

The median duration nulliparous and multiparous women is 50 and 20 minutes.

### **Third Stage**

Time from expulsion of the fetus to expulsion of the placenta

The length of the third stage is usually 15-30 minutes. Sometimes the time may be up to 60 minutes. The physician cannot pull on the cord with excessive force because it may result in an inverted uterus (an obstetrical emergency with significant morbidity).

### **Cardinal Movement**

Cardinal Movements - the movements made by the fetus during the first and second stage of labor. As the force of the uterine contractions stimulates effacement and dilatation of the cervix, the fetus moves toward the cervix. When the presenting part reaches the pelvic bones, it must make adjustments to pass through the pelvis and down the birth canal.

### **Descent**

The fetus head is pushed down into the pelvis in a sideways position.

Flexion - As the fetus head descends, the chin is flexed to come into contact with the infant's sternum. The occiput position allows the occipital bone in the back of the head to lead the way (smallest diameter of the head).

**Engagement** - the presenting part is at the level of the ischial spines or at a zero (0) station.

**Internal rotation** - The amount of internal rotation depends on the position of the fetus and the way the head rotates to accommodate itself to the changing diameters of the pelvis.

### **Extension**

As the previously flexed head slips out from under the pubic bone, the fetus is forced to extend his head so that the head is born pushing upward out of the vaginal canal. The natural curve of the lower pelvis and the baby's head being pushed outward forces

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distention of the perineum and vagina. As it moves through the vaginal canal, the chin lifts up/extends, and the head is delivered. The fetal spine is no longer flexed, but extends to accommodate the body to the contour of the birth canal.

### **External rotation restitution**

When the fetus head is out, it will turn to line up with its back, revealing its position just before internal rotation of the head (restitution).

This helps in internal rotation of the shoulders to an anteroposterior diameter of the pelvic outlet or shoulder rotation.

### **Expulsion**

- (a) The top of the anterior shoulder is seen next just under the pubis.
- (b) Gentle downward pressure by the physician delivers the anterior shoulder.
- (c) The head is gently raised to deliver the posterior shoulder.
- (d) The rest of the body follows the head, which then completes expulsion.
- (e) The fetus remains completely passive as it moves through the birth canal.

### **Terms Related to Fetal Positions**

#### **Lie of an Infant**

Lie refers to the;

- position of the spinal column of the fetus in relation to
- the spinal column of the mother.

#### **There are two types of lie:**

- longitudinal and
- Transverse

**Longitudinal** indicates that the baby is lying lengthwise in the uterus, with its head or buttocks down.

**Transverse** indicates that the baby is lying crosswise in the uterus.

## Presentation (Presenting Part)

Presentation refers to that part of the fetus that is coming through (or attempting to come through) the pelvis first.

## Types of presentations

### 3 types of presentations:

- The vertex or cephalic (head -most common presentation),
- Breech, and
- shoulder presentation.

In vertex or cephalic, the head comes down first

In breech, the feet or buttocks comes down first

in shoulder, the arm or shoulder comes down first (usually referred to as a transverse lie).

### Specific presentation may be evaluated by several ways;

- (1) Abdominal palpation (not always accurate).
- (2) Vaginal exam (may give a good indication but not infallible).
- (3) Ultrasound
- (4) X-ray this confirms the presentation (but used only as a last resort due to possible harm to the fetus as a result of exposure to radiation)

## Attitude

This is the degree of flexion of the fetus body parts (body, head, and extremities) to each other. Flexion is resistance to the descent of the fetus down the birth canal, which causes the head to flex (bend) so that the chin approaches the chest.

## Station

Station refers to the depth that the presenting part has descended into the pelvis in relation to the **ischial spines** of the mother's pelvis.

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### **Measurement of the station is as follows:**

- (a) The degree of advancement of the presenting part through the pelvis is measured in centimeters.
- (b) The ischial spines is the dividing line between plus and minus stations.
- (c) Above the ischial spines is referred to as -1 to -5, the numbers going higher as the presenting part gets higher in the pelvis.
- (d) The ischial spines is zero (0) station.
- (e) Below the ischial spines is referred to +1 to +5, indicating the lower the presenting part advances.

### **Engagement**

This refers to the entrance of the **presenting part of the fetus** into the true pelvis or the largest diameter of the presenting part into the true pelvis.

In relation to the head, the fetus is said to be engaged when it reaches the: midpelvis or at a zero (0) station.

Once the fetus is engaged, the fetus does not go back up.

**Prior to engagement**, the fetus is said to be floating or ballotable.

### **Position**

This is the relationship between a predetermined point of reference or direction on the presenting part of the fetus to the pelvis of the mother.

The maternal pelvis is divided into quadrants.  
Right and left side, viewed as the mother would

### **Anterior and posterior**

This is a line cutting the pelvis in the middle from side to side.  
The top half is anterior and the bottom half is posterior.

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The quadrants never change.

### **TIPS!!!**

When you are describing the quadrants, view them as the mother would.

Specific points on the fetus

Cephalic or head presentation:

- Occiput (O) Refers to the Y sutures on the top of the head.
- Brow or fronto (F) Refers to the diamond sutures or anterior fontanel on the head.
- Face or chin presentation (M) Refers to the mentum or chin.

Breech or buttock presentation

Sacrum or coccyx (S) - point of reference.

Breech birth is associated with a higher perinatal mortality

Shoulder presentation

Seen with a transverse lie

Scapula (Sc) or its upper tip, the acromion (A) would be used for the point of reference.

### **Coding of positions**

Coding simplifies explaining the various positions.

The first letter of the code tells which side of the pelvis the fetus reference point is on (R = right, L = left).

The second letter tells what reference point on the fetus is being used;

Occiput-O, Fronto-F, Mentum-M, Breech-S, Shoulder-Sc or A).

The last letter tells which half of the pelvis the reference point is in;  
(anterior-A, posterior-P, transverse or in the middle-T).

Each presenting part has the possibility of 6 positions.

They are recognized for each position (using occiput) as the reference point;

- 1 Left occiput anterior (LOA).
- 2 Left occiput posterior (LOP).
- 3 Left occiput transverse (LOT).
- 4 Right occiput anterior (ROA).
5. Right occiput posterior (ROP).
- 6 Right occiput transverse (ROT).

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**A transverse position does not** use a first letter and is not the same as a transverse lie or presentation.

- 1 Occiput at sacrum (O.S.) or occiput at posterior (O.P.).
- 2 Occiput at pubis (O.P.) or occiput at anterior (O.A.).

### **Types of breech presentations**

#### **Complete or full breech**

Involves flexion of the fetus legs  
It looks like the fetus is sitting in a tailor fashion.  
The buttocks and feet appear at the vaginal opening almost simultaneously.

#### **Frank and single breech**

The fetus thighs are flexed on his abdomen.  
The legs are against the trunk and feet are in his face (foot-in-mouth posture).  
This is the most common and easiest breech presentation to deliver.

#### **Incomplete breech**

The fetus feet or knees will appear first.  
The feet are labeled single or double footing, depending on whether 1 or 2 feet appear first.

### **AFTER DELIVERY**

#### **SEXUAL INTERCOURSE**

The woman is encouraged to wait until any bleeding after the birth (lochia) has stopped, which should be by about three weeks after the baby's birth (may vary depending on the individual's condition). When the lochia is still present the wound left in the uterus (womb) by the placenta coming out, is still healing.

If the women have sexual intercourse before the bleeding has stopped, they may get an infection. When lochia has stopped, it indicates that the endometrium has healed

## TERMINOLOGY

G= Gravida means # of Pregnancy

P= Parity means # of deliveries > 20 weeks , Ptpal (T=term,preterm,abortion, live child)

Term= > 37 wks,< 42 wks, or >2500 gms

Preterm= 20-37 wks,>500 gms <2500gms

Abortion= <20 weeks, <500gms,<25cm

Post term= >42 weeks

Puerperium= birth -42 days postpartum

Trimesters: 1st <12 wks, 2nd = 13-28 wks, 3rd = >28 wks

Ballottement - Positive ballottement; method of diagnosing pregnancy: with the tip of the forefinger in the vagina, a sharp tap is made against the lower segment of the uterus; the fetus, if present, is tossed upward and (if the finger is retained in place) will be felt to strike against the wall of the uterus as it falls back- Passive movement of the unengaged fetus.

Bartholin's glands - (Bartholin glands or greater vestibular glands) are 2 pea sized glands located slightly posterior and to the left and right of the opening of the vagina. They secrete mucus to lubricate the vagina. On the pelvic examination the physician sometime observe a red swollen area on the side of the vaginal orifice - an enlargement of Bartholin's glands.

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Gravida describes the total number of confirmed pregnancies that a woman has had, regardless of the outcome.

Parity is referred to as the number of births that a woman has had after 20 weeks gestation. If a woman gives birth to more than one baby from a pregnancy, the pregnancy and birth are only counted once.

Placenta abruptio - is separation of the placenta from its attachment to the uterus wall before the baby is delivered.

Placenta previa is a problem of pregnancy in which the placenta grows in the lowest part of the womb (uterus) and covers all or part of the opening to the cervix. Sometimes, the placenta partly or completely covers the cervix (referred to as a previa). There are different forms of placenta previa:

- Marginal- The placenta is next to the cervix but does not cover the opening.
- Partial- The placenta covers part of the cervical opening.
- Complete -The placenta covers all of the cervical opening.

Chadwick's sign is a bluish /purple blue tinge (discoloration) of the cervix, vagina, and labia resulting from the increased blood flow. It can be observed as early as 6 to 8 wks after conception, and its presence is an early sign of pregnancy.

Supine hypotension - is caused by pressure of the gravid uterus on the ascending vena cava when the woman is lying in a supine position which decreases the return of the blood flow.

A teratogen is an agent or factor that causes the production of physical defects in the developing fetus. Many drugs are known to have teratogenic effects on the fetus if taken during pregnancy.

**TAKE EXAM**

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