**PHYSIOLOGICAL & PSYCHOLOGICAL CHANGES during PREGNANCY**

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**What is pregnancy?**

Pregnancy is the term used to describe **the period in which a fetus develops inside a woman's uterus**. Pregnancy usually lasts about 40 weeks, or just over 9 months, as measured from the last menstrual period to delivery. Health care providers refer to three segments of pregnancy, called trimesters.

**Different Types of Pregnancies:**  
Intrauterine Pregnancies: These are the normal pregnancies, when the fetus implant inside the uterus.  
   
Singlet Pregnancies.   
  
Multiple Pregnancies.   
  
High-Risk Pregnancies.

**The physiological changes during pregnancy**

Genital changes Respiratory changes

Breast changes Haematological changes

Skin changes Endocrinal changes

Skeletal changes metabolic changes

Urinary changes cardiovascular changes

GI changes

**Physiology changes during pregnancy:**

Physiological changes **occur with aging in all organ systems**. The cardiac output decreases, blood pressure increases and arteriosclerosis develops. The lungs show impaired gas exchange, and slower expiratory flow rates.

Some of the changes in maternal physiology during pregnancy include, for example, increased maternal fat and total body water, decreased plasma protein concentrations, especially albumin, increased maternal blood volume, cardiac output, and blood flow to the kidneys and, and decreased blood pressure .

1. **Genital changes**

This is because the cervix and vagina undergo hormonally regulated changes in pregnancy which causes an **increased production of cervical mucus and vaginal discharge**. It changes throughout pregnancy from thick and sticky to thin and watery

1. The body of the uterus

Height and weight: the height increases from 7.5 cm to 35cm and the weight increases from 50g to 1000g at term

1. The cervix : cervical edema , congestion, and it becomes soft cervical mucus closing the cervical canal which increased secretion from glands

c. The vagina: shows increased vascularity and distention of vagina at birth

d. The ovary: shows increased vascularity and size

e. Pelvic ligaments: relaxation of the ligaments and relaxation of the pelvic joints**.**

**2. Breast change**

Increased size and vascularity, warm, tense and tender also increased pigmentation of the nipple and areola which Colostrums like fluid is expressed at the end of the 3rd month of pregnancy or in first trimester.

1. **Skin changes and Pigmentation:** due to increased melanocyte stimulating hormone, the most common skin change and stretch of the abdominal wall are:

**Striae gravidarum:** rupture of the subcutaneous elastic fibers. pink lines in flanks become white after labor.

**linea nigra**: pigmentation of the linea alba , more marked below the umbilicus

**chloasma**: Butterfly pigmentation of the face **(mask of pregnancy)**

**4. Urinary and Kidneys changes:**

Increase in size, hydronephrosis and effective renal plasma flow is increased which lead to dilatation of the ureters.

Urinary output diminished on a normal fluid intake, 100 extra liters of fluid pass into the renal tubules each day. Extracellular water is increased by 6 to 7 liters during pregnancy this is due to increased amounts of aldosterone progesterone and estrogen

1. **Gastro-intestinal changes** :

Increase appetite & thirst- frequent small snacks

* Heart burn (reflux esophagitis) relaxation of the cardiac sphincter due to progesterone
* Emesis gravidarum, morning sickness in 50 %
* Decreased gastric acidity, which interfere with iron absorption

1. Cardiovascular changes :

The major pregnancy-related hemodynamic changes include **increased cardiac output, expanded blood volume, and reduced systemic vascular resistance and blood pressure**. These changes contribute to optimal growth and development of the fetus and help to protect the mother from the risks of delivery, such as hemorrhage.

The heart rate rises synchronously from 70 to 85 b.p.m. to 10-15 b.p.m in minute. stroke volume rises.

Blood pressure slight drop in the 2nd trimester small fall in systolic, greater fall in diastolic B.P opening of arterio-venous shunts at the placenta -- increased pulse pressure

Supine maternal hypotension syndrome in 8% of the women 2nd half of the pregnancy occurs in the supine position due to pressure the uterus on the inferior vena cava--decreased venous return and cardiac output.

1. **Haematological changes:**

* Circulating red cell mass increases by 20-30% (rises more in multiple pregnancies and iron supplement)
* Plasma folate concentration halves by term ( renal clearance)red cell folate concentration falls less
* Mild maternal anemia associated with increased placental/birthweight ratio decreased birthweight
* Erythropoietin rises especially if iron supplement not taken
* Fall in packed cell volume from 36% in early pregnancy to 32% in the 3rd trimester ( normal plasma volume expansion)
* WBC count rises ( increase in polymorphonuclear leucocytes)

1. **Respiratory changes:**

**Increases in size**. Diaphragm, the large flat muscle used in breathing, moves upward toward the chest. Increase in the amount of air breathed in and out. Decrease in amount of air the lungs can handle

The major effect of labor upon the respiratory system is related to the increased muscular work, metabolic rate, and oxygen consumption, which increases 40% to 60% during labor.

1. **Endocrinal change**:

During pregnancy, a woman experiences a change in her endocrine system. Throughout pregnancy **the levels of progesterone and estrogen increase (placental hormones)**the estrogen being produced by the placenta and the progesterone being produced by the corpus luteum and later by the placenta.

T**hyroid**/ **increases in size and activity and physiological goiter**

1. **Metabolic changes:**

**Maternal metabolism changes substantially during pregnancy. Early gestation can be viewed as an anabolic state in the mother with an increase in maternal fat stores and small increases in insulin sensitivity. Hence, nutrients are stored in early pregnancy to meet the feto-placental and maternal demands of late gestation and lactation. In contrast, late pregnancy is better characterized as a catabolic state with decreased insulin sensitivity (increased insulin resistance). An increase in insulin resistance results in increases in maternal glucose and free fatty acid concentrations, allowing for greater substrate availability for fetal growth**

**Psychological change during pregnancy:**

When woman becomes pregnant, the body begins to prepare for safe guarding and maintaining the pregnancy. This increases levels of the hormones estrogen and progesterone in their blood

Pregnancy is always associated with changes in psychological functioning of pregnant women. It is usually associated with ambivalence, frequent mood changes, varying from anxiety, fatigue, exhaustion, sleepiness, and depressive reactions to excitement.

**Causes**

Psychological reaction can be caused by two factors: hormonal changes or narcissism**.**

**Hormonal change:**

Higher levels of progesterone and estrogen are important for a healthy pregnancy, but are often the cause of some common unwanted side effects. This is especially true in the first trimester.

Apart from sicknes and tiredness, it's common to have mood fluctuation   and swing which feel tearful or easily irritated. Once the body has adapted to the higher levels of these hormones, the symptoms usually resolved. However, some women will experience them throughout their pregnancy.

**Coping with emotions during pregnancy**

It can be hard to think clearly or feel positive when you are feeling worried and tired. Taking good physical care especially getting plenty of rest and sleep may help to keep troubling emotions in proportion. It can be helpful to eat several small, healthy meals a day and try to avoid sugary foods.

[Gentle to moderate exercise](https://www.nct.org.uk/pregnancy/exercise-and-fitness/exercise-during-pregnancy-what-know) can help to improve mood and general fitness in pregnancy, helping to prepare for labour and avoid some complications of pregnancy.

Discussing the feelings and worries with someone who makes her feel comfortable can help to regulate the emotions and limit worry and anxiety.

Talking to other expectant parents may also reveal that are not alone in her experiences, as well as providing peer support.

**Calming techniques:** some people find listening to music and singing helpful in calming emotions and enhancing wellbeing in pregnancy. Writing about your emotions and noting down how you feel about stressful events can also be a good tool for managing stress and anxiety. Attending [antenatal yoga classes](https://www.nct.org.uk/courses-workshops/nct-yoga-for-pregnancy) has been shown to reduce stress and anxiety, and support you in preparing for birth.