#3 GESTATIONAL CONDITIONS

I. HYPEREMESIS GRAVIDARUM (HG)

- A pregnancy complication that is characterized by severe nausea, vomiting, weight loss, and possible dehydration.
- Considered more severe than morning sickness.
- Often symptoms get better after the 20th week of pregnancy but may last the entire pregnancy duration.

Signs and Symptoms

- When vomiting is severe, it may result in the following:
  - Loss of 5% or more of pre-pregnancy body weight
  - Dehydration, causing ketosis and constipation
  - Nutritional disorders, such as vitamin B_1 (thiamine) deficiency, vitamin B_6 (pyridoxine) deficiency or vitamin B_{12} (cobalamin) deficiency
  - Metabolic imbalances such as metabolic ketoacidosis or thyrotoxicosis
  - Physical and emotional stress
  - Difficulty with activities of daily living
- Symptoms can be aggravated by hunger, fatigue, prenatal vitamins (especially those containing iron), and diet.
- Many women with HG are extremely sensitive to odors in their environment; certain smells may exacerbate symptoms.
- Excessive salivation, also known as "**Sialorrhea Gravidarum**", is another symptom experienced by some women.
- HG tends to occur in the first trimester of pregnancy and lasts significantly longer than morning sickness. While most women will experience near-complete relief of morning sickness symptoms near the beginning of their second trimester, some sufferers of HG will experience severe symptoms until they give birth to their baby, and sometimes even after giving birth.

Causes

- There are numerous theories regarding the cause of HG, but the cause remains controversial.
- It is thought that HG is due to a combination of factors which may vary between women and include genetics. Women with family members who had HG are more likely to develop the disease.
- One factor is an adverse reaction to the hormonal changes of pregnancy, in particular, elevated levels of beta Human Chorionic Gonadotropin (β-hCG). This theory would also explain why hyperemesis gravidarum is most frequently encountered in the first trimester (often around 8–12 weeks of gestation), as β-hCG levels are highest at that time and decline afterward.
- Another postulated cause of HG is an increase in maternal levels of estrogens (decreasing intestinal motility and gastric emptying leading to nausea/vomiting).

Management

- Dry bland food and oral rehydration are first-line treatments.
- If conservative dietary measures fail, more extensive treatment such as the use of antiemetic medications and intravenous rehydration may be required.
- If oral nutrition is insufficient, intravenous nutritional support may be needed.

Complications

Pregnant Woman

- If HG is inadequately treated, anemia, hyponatremia, kidney failure, hypoglycemia, jaundice, malnutrition, deep vein thrombosis, pulmonary embolism, vasospasms of cerebral arteries are possible consequences.
- Depression and post-traumatic stress disorder are common secondary complications of HG and emotional support can be beneficial.

Infant

- The effects of HG on the fetus are mainly due to electrolyte imbalances caused by HG in the mother.
- Infants of women with severe hyperemesis who gain less than 7 Kgs. (15 lb) during pregnancy tend to be of lower birth weight, small for gestational age, and born before 37 weeks gestation.
- In contrast, infants of women with hyperemesis who have a pregnancy weight gain of more than 7 Kgs. appear similar to infants from uncomplicated pregnancies.
- There is no significant difference in the neonatal death rate in infants born to mothers with HG compared to infants born to mothers who do not have HG.
- Children born to mothers with undertreated HG have a fourfold increase in neurobehavioral diagnoses.

II. ECTOPIC PREGNANCY

- In a **normal pregnancy**, the ovary releases an egg into your fallopian tube. If the egg meets with a sperm, the fertilized egg moves into your uterus to attach to its lining and continues to grow for the next 9 months.
- But in up to **1 of every 50 pregnancies**, the fertilized egg stays in your fallopian tube. In that case, it's called an **Ectopic Pregnancy** or **Tubal Pregnancy**.
- In rare cases, the fertilized egg attaches to one of the **ovaries**, another organ in the abdomen, the **cornua** (horn) of the uterus or even the **cervix**. In any case, instead of celebrating the pregnancy, the pregnant woman's life is in danger.
- Ectopic pregnancies require **emergency treatment**.
- Most often, ectopic pregnancy happens within the first few weeks of pregnancy, usually by the 8th week of pregnancy.
- In extremely rare cases, the fetus might survive (This is not possible in a tubal pregnancy, cornual or cervical).

Symptoms of Ectopic Pregnancy

- Light vaginal bleeding
- Nausea and vomiting with pain
- Lower abdominal pain
- Sharp abdominal cramps
- Pain on one side of your body
- Dizziness or weakness
- Pain in your shoulder, neck, or rectum
- If the fallopian tube ruptures, the pain and bleeding could be severe enough to cause fainting.

If the patient is experiencing these symptoms, contact the health care provider immediately and go to the emergency room. Getting to the hospital quickly is important to reduce the risk of hemorrhage (severe bleeding).

Causes of an Ectopic Pregnancy

One cause of an ectopic pregnancy is a damaged fallopian tube that doesn't let a fertilized egg into the uterus, so it implants in the fallopian tube or somewhere else.

What caused an ectopic pregnancy might not be known. But the woman is of higher risk if she has:

- Current use of intrauterine device (IUD);
- History of pelvic inflammatory disease (PID);
- Sexually-transmitted diseases such as chlamydia and gonorrhea;
- Congenital abnormality of the fallopian tube;
- History of pelvic surgery (scarring may block the fertilized egg from leaving the fallopian tube);
- History of ectopic pregnancy;
- Unsuccessful tubal ligation (surgical sterilization) or tubal ligation reversal;
- Use of fertility drugs;
- Infertility treatments such as in vitro fertilization (IVF).

Diagnosing an Ectopic Pregnancy

To view the uterus' condition and fallopian tubes, the following tests may be performed:

- Pregnancy test
- Pelvic examination
- Ultrasound

If an ectopic pregnancy has been confirmed, the health care provider will decide on the best treatment based on the client's condition and future plans for pregnancy.

Treating an Ectopic Pregnancy

- If the **fallopian tube has ruptured**, **emergency surgery** is necessary to stop the bleeding. In some cases, the **fallopian tube and ovary may be damaged** and will have to be **removed.**
- If the **fallopian tube has not ruptured** and the **pregnancy has not progressed very far**, **laparoscopic surgery** may be all that is needed to remove the embryo and repair the damage.

  LAPAROSCOPE – is a thin, flexible instrument inserted through small incisions in the abdomen. During this surgery, a tiny incision is made in the fallopian tube and the embryo is removed, preserving the fallopian tube's integrity.
- In some cases, medication may be used to stop the growth of pregnancy tissue. This treatment option may be appropriate if the tube is not ruptured and pregnancy has not progressed very far.
- After medical treatment for an ectopic pregnancy, the patent will usually need to undergo another blood tests to detect the HCG level to make sure that the entire tubal pregnancy was removed.

Getting Pregnant After an Ectopic Pregnancy

- Most women who had an ectopic pregnancy have normal succeeding pregnancies and births, even if a fallopian tube was removed.
- As long as there is one normally working fallopian tube, one can get pregnant.
- If caused by a treatable illness, such as a sexually transmitted disease, getting treated for STD can improve the chances of a successful pregnancy. The infection is not what caused the ectopic – it is the scarring that occurs due to the infection. Treatment of the infection does not get rid of the damage already done.
- Talk with your doctor about how long to wait after an ectopic pregnancy before trying to conceive again. Some doctors suggest waiting 3 to 6 months.
- After an ectopic pregnancy, take the time needed to heal the body and mind.
- Above all, tell the patient not to blame herself. Counseling or pregnancy loss support groups can help you and your partner cope. Ask your doctor about groups near you.

III. HYDATIDIFORM MOLE

Definition:

- A rare mass or growth that forms inside the womb (uterus) at the beginning of a pregnancy. It is a type of Gestational Trophoblastic Disease (GTD).
- A molar pregnancy - is a noncancerous tumor that develops in the uterus.

Causes:

- Results from too much production of the tissue that is supposed to develop into the placenta.
- A molar pregnancy starts when an egg is fertilized, but instead of resulting to a normal, viable pregnancy, the placenta develops into an abnormal mass of cysts.

Prognosis:

- Most Hydatidiform moles are 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.
- In some cases, 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 into a chorio-carcinoma. This is a fast-growing cancer. It is usually treated with chemotherapy, and can be life-threatening.

Types:

- ***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.

Risk Factors:

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

- ***Maternal Age.*** A molar pregnancy is more likely for a woman older than age 35 or younger than age 20.
- ***Previous Molar Pregnancy***. If you've had one molar pregnancy, you're more likely to have another. A repeat molar pregnancy happens, on average, in 1 to 2 out of every 100 women.

Symptoms:

- 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 & Tests:

1. ***Pelvic Examination***
   - May show signs similar to a normal pregnancy.
   - The size of the womb may be abnormal and there may be no heart sounds from the baby.
   - There may be some vaginal bleeding.
2. ***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.
- A Hysterectomy may be an option for older women who do not wish to become pregnant in the future.
- In case of partial molar pregnancy, a woman may choose to continue pregnancy. However, this pregnancy has very high-risk which includes:
  - Bleeding
  - Problems with BP
  - Premature delivery

Health care provider needs to thoroughly discuss the risks with the women before deciding to continue the pregnancy. The condition may become worse.

After the treatment:

- HCG level will be followed.
- Avoid another pregnancy for 6 to 12 months. 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.

Possible Complications:

- ***Complications of molar pregnancy include:***
  - Change to invasive molar disease or chorio-carcinoma
  - Preeclampsia
  - Thyroid problems
  - 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

IV. INCOMPETENT CERVIX

- Also called **Cervical Weakness** or **Cervical Insufficiency**, is a medical condition of pregnancy in which the cervix begins to dilate (widen) and efface (thin) before the pregnancy has reached term.

- It is the inability of the uterine cervix to retain a pregnancy in the absence of the signs and symptoms of clinical contractions, or labor, or both in the second trimester.
- Cervical weakness may cause miscarriage or preterm birth during the second and third trimesters.
- Another sign of cervical weakness is ***funneling*** at the internal orifice of the uterus, which is a dilation of the cervical canal at this location.
- In cases of cervical weakness, dilation and effacement of the cervix may occur without pain or uterine contractions.
- In a normal pregnancy, dilation and effacement occurs in response to uterine contractions.
- Cervical weakness becomes a problem when the cervix is pushed to open by the growing pressure in the uterus as pregnancy progresses.
- If the responses are not halted, rupture of the membranes and birth of a premature baby can result.

Risk Factors

Risk factors for premature birth or stillbirth due to cervical weakness include:

- Diagnosis of cervical weakness in a previous pregnancy,
- Previous preterm premature rupture of membranes,
- History of conization (cervical biopsy), and
- Uterine anomalies.

Repeated procedures (such as mechanical dilation, especially during late pregnancy) appear to create a risk. Additionally, any significant trauma to the cervix can weaken the tissues involved.

Diagnosis

- Diagnosis of cervical weakness can be challenging and is based on a history of painless cervical dilation usually after the first trimester without contractions or labor and in the absence of other clear pathology.
- Normally, the cervix should be at least 30 mm in length. Cervical weakness is variably defined. However, a common definition is a cervical length of less than 25 mm at or before 24 weeks of gestational age. The risk of preterm birth is inversely proportional to cervical length:
  - Less than 25 mm; 18% risk of preterm birth
  - Less than 20 mm; 25% risk of preterm birth
  - Less than 15 mm; 50% risk of preterm birth

Treatment

Cervical weakness is not generally treated except when it appears to threaten a pregnancy.

- **Cervical Cerclage** a surgical technique that reinforces the cervical muscle by placing sutures above the opening of the cervix to narrow the cervical canal.
- **Cervical Pessary** is being studied as an alternative to cervical cerclage since there are fewer potential complications. A silicone ring is placed at the opening to the cervix early in the pregnancy, and removed later in the pregnancy prior to the time of expected delivery. Further study is needed to determine whether a cervical pessary is equal or superior to current management.

V. SPONTANEOUS ABORTION

- Also known as **Miscarriage** and **Pregnancy Loss**, is the natural death of an embryo or fetus before it reaches the **Age of Viability**, after which fetal death is known as a stillbirth.
- The most common symptom of spontaneous abortion is vaginal bleeding with or without pain. Sadness, anxiety and guilt often occur afterwards.

- Tissue and clot-like material may leave the uterus and pass through and out of the vagina.
- When a woman keeps having miscarriages, infertility is present.

Signs and Symptoms

- Vaginal spotting, abdominal pain, cramping, and fluid, blood clots, and tissue passing from the vagina.
- Bleeding can be a symptom of spontaneous abortion, but many women also have bleeding in early pregnancy and don't miscarry.
- Bleeding during pregnancy may be referred to as a threatened abortion. Of those who seek clinical treatment for bleeding during pregnancy, about half will miscarry.

Spontaneous abortion may be detected during an ultrasound exam, or through serial HCG testing.

Risk Factors

1. **Trimesters**

   First trimester
   - Blighted ovum (30 – 40%)
   - Chromosomal abnormalities (>half in the 1st 13 weeks)
   - Autosomal trisomy (22–32%)
   - Monosomy X (5–20%)
   - Triploidy (6–8%)
   - Tetraploidy (2–4%)
   - Other structural chromosomal abnormalities (2%).

   Genetic problems are more likely to occur with older parents; this may account for the higher rates observed in older women.

   Second and Third Trimester
   - Uterine malformation
   - Growths in the uterus (fibroids)
   - Cervical problems
   - Infection

2. **Age**
   - < 35 – 10%
   - >40 – 45%
   - Risk begins to increase around the age of 30.
   - Paternal age is also associated with increased risk.

3. **Obesity, Eating Disorders and Caffeine**
   - ***Obesity*** is not only associated with miscarriage; it can also result in sub-fertility and other adverse pregnancy outcomes.
   - Recurrent miscarriage is also related to obesity.
   - Women with ***Bulimia Nervosa*** and ***Anorexia Nervosa***
   - ***Hyperemesis Gravidarum***
   - ***Caffeine*** consumption, at least at higher levels of intake.

4. **Endocrine Disorders**
   - Thyroid Disorders
   - Iodine deficiency
   - Poorly controlled Insulin-Dependent Diabetes Mellitus

5. Food poisoning

- Food contaminated with listeriosis, toxoplasmosis, and salmonella is associated with an increased risk of miscarriage.

6. Amniocentesis and Chorionic Villus Sampling (CVS)

Amniocentesis

- A sample of amniotic fluid is obtained by the insertion of a needle through the abdomen and into the uterus.

Chorionic Villus Sampling

- A similar procedure with a sample of tissue removed rather than fluid.

These procedures are not associated with pregnancy loss during the 2nd trimester but they are associated with miscarriages and birth defects in the 1st trimester.

Miscarriage caused by invasive prenatal diagnosis (CVS and amniocentesis) is rare (about 1%).

7. Surgery

- The effects of surgery on pregnancy are not well-known including the effects of bariatric surgery. Abdominal and pelvic surgery are not risk factors in miscarriage.
- Ovarian tumors and cysts that are removed have not been found to increase the risk of miscarriage.
- The exception to this is the removal of the corpus luteum from the ovary. This can cause fluctuations in the hormones necessary to maintain the pregnancy.

8. Medications

- Immunizations have not been found to cause miscarriage.
- There is no significant association between antidepressant medication and spontaneous abortion.

9. Chemotherapy and Radiation Treatments for Cancer

- Ionizing radiation levels given to a woman during cancer treatment cause miscarriage. Exposure can also impact fertility.
- Use of chemotherapeutic drugs used to treat childhood cancer increases the risk of miscarriage.

10. Intercurrent Diseases

- ***Polycystic Ovary Syndrome*** (PCOS) – may increase the risk of miscarriage.
- ***Diabetes*** – Metformin treatment in pregnancy has not been shown to be safe.
- ***Hypothyroidism*** – Severe cases of hypothyroidism increase the risk of miscarriage. The effect of milder cases of hypothyroidism on miscarriage rates has not been established.
- ***Luteal Phase Defect*** (LPD) – is a failure of the uterine lining to be fully prepared for pregnancy. This can keep a fertilized egg from implanting or result in miscarriage.
- ***Mycoplasma Genitalium*** – infection is associated with increased risk of preterm birth and miscarriage.
- Infections can increase the risk of a miscarriage: Rubella (German Measles), Cytomegalovirus, Bacterial Vaginosis, HIV, Chlamydia, Gonorrhoea, Syphilis, and Malaria.

11. Anatomical defects and trauma

- The structure of the uterus has an effect on the ability to carry a child to term. Anatomical differences are common and can be congenital.
- In some women, cervical incompetence or cervical insufficiency occurs with the inability of the cervix to stay closed during the entire pregnancy. It does not cause 1st trimester miscarriages. In the 2nd trimester it is associated with an increased risk of miscarriage. It is identified after a premature birth has occurred at about 16–18 weeks into the pregnancy.
- During the second trimester, major trauma can result in a miscarriage.

12. Smoking

- Tobacco (cigarette) smokers have an increased risk of miscarriage. There is an increased risk regardless of which parent smokes, though the risk is higher when the gestational mother smokes.

13. Morning sickness

- **Nausea and Vomiting of Pregnancy** (NVP) are associated with a decreased risk. Several possible causes have been suggested for morning sickness but there is still no agreement. NVP may represent a defense mechanism which discourages the mother's ingestion of foods that are harmful to the fetus; according to this model, a lower frequency of miscarriage would be an expected consequence of the different food choices made by women experiencing NVP.

14. Others

- Alcohol increases the risk of miscarriage.
- Progesterone has not been found to be effective in preventing miscarriage.
- Cocaine use increases the rate of miscarriage.
- Some infections have been associated with miscarriage. These include *Ureaplasma urealyticum*, *Mycoplasma hominis*, group B streptococci, HIV-1, and syphilis. Infections of *Chlamydia trachomatis*, *Camphylobacter fetus*, and *Toxoplasma gondii* have not been found to be linked to miscarriage.

Diagnosis

- Blood loss, pain, or both – transvaginal ultrasound
- If viable intrauterine pregnancy is not found with ultrasound – Blood tests (serial βHCG tests) can be performed to rule out ectopic pregnancy, which is a life-threatening situation.
- When looking for microscopic pathologic symptoms, one looks for the products of conception. Microscopically, these include villi, trophoblast, fetal parts, and background gestational changes in the endometrium.
- When chromosomal abnormalities are found in more than one miscarriage, genetic testing of both parents may be done.

Classification

- ***Threatened Abortion*** – describes any bleeding during pregnancy, prior to viability that has yet to be assessed. At investigation it may be found that the fetus remains viable and the pregnancy continues without further problems.
- ***Inevitable Abortion*** – occurs when the cervix has already dilated, but the fetus has yet to be expelled. This usually will progress to a complete abortion. The fetus may or may not have cardiac activity.
- ***Complete Abortion*** – is when all products of conception have been expelled; these may include the trophoblast, chorionic villi, gestational sac, yolk sac, and fetal pole (embryo); or later in pregnancy the fetus, umbilical cord, placenta, amniotic fluid, and amniotic membrane.
- ***Incomplete Abortion*** – occurs when some products of conception have been passed, but some remains inside the uterus.
- ***Missed Abortion –*** is when the embryo or fetus has died, but a miscarriage has not yet occurred. It is also referred to as delayed miscarriage, silent miscarriage, or missed miscarriage.
- ***Septic Abortion*** – occurs when the tissue from a missed or incomplete miscarriage becomes infected, which carries the risk of spreading infection (septicaemia) and can be fatal.
- ***Recurrent Abortion*** ("recurrent pregnancy loss" (RPL) or "habitual abortion") is the occurrence of multiple consecutive miscarriages; the exact number used to diagnose recurrent miscarriage varies.

- ***Induced Abortion*** – may be performed by a physician for women who do not want to continue the pregnancy.
- ***Self-Induced Abortion*** – performed by a woman or a non-medical personnel, is extremely dangerous and is still a cause of maternal mortality in some countries.

The physical symptoms of abortion vary according to the length of pregnancy, though most miscarriages cause pain or cramping. The size of blood clots and pregnancy tissue that are passed become larger with longer gestations.

After 13 weeks' gestation, there is a higher risk of placenta retention.

Prevention

- Prevention of a miscarriage can sometimes be accomplished by decreasing risk factors. This may include good prenatal care, avoiding drugs and alcohol, preventing infectious diseases, and avoiding x-rays.
- Identifying the cause of the miscarriage may help prevent future pregnancy loss, especially in cases of recurrent miscarriage.

Non-Modifiable Risk Factors

Preventing a miscarriage in subsequent pregnancies may be enhanced with assessments of:

- Immune status
- Chemical and occupational exposures
- Anatomical defects
- Intercurrent diseases
- Polycystic ovary syndrome
- Previous exposure to Chemotherapy and Radiation
- Medications
- Surgical history
- Endocrine disorders
- Genetic abnormalities

Modifiable Risk Factors

Maintaining a healthy weight and good pre-natal care can reduce the risk of miscarriage. Some risk factors can be minimized by avoiding the following:

- Smoking
- Cocaine use
- Alcohol
- Poor nutrition
- Occupational exposure to agents that can cause miscarriage
- Medications associated with miscarriage
- Drug abuse

VI. PLACENTA PREVIA

- When the placenta attaches inside the uterus but near or over the cervical opening.

Signs and Symptoms

- Painless, bright red vaginal bleeding. This commonly occurs around 32 weeks of gestation, but can be as early as late mid-trimester.
- More than half of women affected by placenta previa have bleeding before delivery.

- This bleeding often starts mildly and may increase as the area of placental separation increases. Placenta previa should be suspected if there is bleeding after 24 weeks of gestation.
- Bleeding after delivery occurs in about 22% of those affected.
- Women may also present as a case of failure of engagement of fetal head.

Cause

- The exact cause of placenta previa is unknown.
- It is hypothesized to be related to abnormal vascularization of the endometrium caused by scarring or atrophy from previous trauma, surgery, or infection. These factors may reduce differential growth of lower segment, resulting in less upward shift in placental position as pregnancy advances.

Risk Factors

The following have been identified as risk factors for placenta previa:

- Previous placenta previa (recurrence rate 4–8%), caesarean delivery, myomectomy or endometrium damage caused by D & C.
- Women who are younger than 20 are at higher risk and women older than 35 are at increasing risk as they get older.
- Alcohol use during pregnancy was previous listed as a risk factor, but is discredited by this article.
- Women who have had previous pregnancies (multiparity), especially a large number of closely spaced pregnancies, are at higher risk due to uterine damage.
- Smoking during pregnancy; cocaine use during pregnancy.
- Women with a large placenta from twins or erythroblastosis are at higher risk.
- Race is a controversial risk factor, with some studies finding that people from Asia and Africa are at higher risk and others finding no difference.
- Placental pathology (Vellamentous insertion, succinturiate, bipartite i.e. bilobed placenta etc.).
- Baby is in unusual position: breech (buttocks first) or transverse (lying horizontally across womb).
- Placenta previa is itself a risk factor of placenta accreta.

Classification

Minor – Placenta is in the lower uterine segment, but the lower edge does not cover the internal os.

Major – Placenta is in lower uterine segment, and the lower edge covers the internal os.

Other than that placenta previa can be also classified as:

Complete: When the placenta completely covers the cervix

Partial: When the placenta partially covers the cervix

Marginal: When the placenta ends near the edge of cervix, about 2 cm from the internal cervical os

Diagnosis

- History may reveal antepartum hemorrhage.
- Abdominal examination usually finds the uterus non-tender, soft and relaxed.
- Leopold's Maneuvers may find the fetus in an oblique or breech position or lying transverse as a result of the abnormal position of the placenta.
- Malpresentation is found in about 35% cases. Vaginal examination is avoided in known cases of placenta previa.

Confirmatory

- Previa can be confirmed with an ultrasound. Transvaginal ultrasound has superior accuracy as compared to transabdominal one, thus allowing measurement of distance between placenta and cervical os.

False positives may be due to following reasons:

- Overfilled bladder compressing lower uterine segment
- Myometrial contraction simulating placental tissue in abnormally low location
- Early pregnancy low position, which in third trimester may be entirely normal due to differential growth of the uterus.

In such cases, repeat scanning is done after an interval of 15–30 minutes.

Management

- Initial assessment to determine the status of the mother and fetus is required.
- Although mothers used to be treated in the hospital from the first bleeding episode until birth, it is now considered safe to treat placenta previa on an outpatient basis if the fetus is at less than 30 weeks of gestation, and neither the mother nor the fetus are in distress.
- Immediate delivery of the fetus may be indicated if the fetus is mature or if the fetus or mother are in distress.
- Blood volume replacement (to maintain blood pressure) and blood plasma replacement (to maintain fibrinogen levels) may be necessary.

Delivery

The method of delivery is determined by clinical state of the mother, fetus and ultrasound findings.

- In minor (traditional grade I & II), vaginal delivery is possible (2 cm away from internal os)
- In cases of fetal distress and major (traditional grade III and IV) a CS is indicated.
- CS is contraindicated in cases of disseminated intravascular coagulation.

Complications

Maternal

- Antepartum hemorrhage
- Malpresentation
- Abnormal placentation
- Postpartum hemorrhage
- Placenta previa increases the risk of puerperal sepsis and postpartum hemorrhage because the lower segment to which the placenta was attached contracts less well post-delivery.

Fetal

- IUGR (15% incidence)[12]
- Hypoxia
- Premature delivery
- Death

VII. ABRUPTIO PLACENTA

- When the placenta separates early from the uterus, in other words separates before childbirth.
- It occurs most commonly around 25 weeks of pregnancy.

Signs and Symptoms

In the early stages, there may be no symptoms. When symptoms develop, they tend to develop suddenly. Common symptoms include:

- Sudden-onset abdominal pain, contractions that seem continuous and do not stop,
- Vaginal bleeding,
- Enlarged uterus disproportionate to the gestational age of the fetus,
- Decreased fetal movement, and
- Decreased fetal heart rate.
- Vaginal bleeding, if it occurs, may be bright red or dark.

Risk Factors

- Pre-eclampsia
- Chronic hypertension.
- Short umbilical cord
- Prolonged rupture of membranes (>24 hours).
- Multiparity
- Multiple pregnancy
- Maternal age: pregnant women who are younger than 20 or older than 35 are at greater risk
- The risk of placental abruption increases six-fold after severe maternal trauma.
- Anatomical risk factors include uncommon uterine anatomy (e.g. bicornuate uterus) and leiomyoma.
- Substances include cocaine and tobacco when consumed during pregnancy, especially the third trimester.
- History of placental abruption or previous CS increases the risk by a factor of 2.3.

Diagnosis

- The fundus may be monitored because a rising fundus can indicate bleeding.
- Ultrasound may be used to rule out placenta previa but is not diagnostic for abruption. The diagnosis is one of exclusion, meaning other possible sources of vaginal bleeding or abdominal pain have to be ruled out in order to diagnose placental abruption.
- Of note, use of Magnetic Resonance Imaging has been found to be highly sensitive in depicting placental abruption, and may be considered if no ultrasound evidence of placental abruption is present, especially if the diagnosis of placental abruption would change management.

Classification

Based on severity:

Class 0: Asymptomatic. Diagnosis is made retrospectively by finding an organized blood clot or a depressed area on a delivered placenta.

Class 1: Mild and represents approximately 48% of all cases. Characteristics include the following:

- No vaginal bleeding to mild vaginal bleeding
- Slightly tender uterus
- Normal maternal blood pressure and heart rate
- No coagulopathy
- No fetal distress

***Class 2*:** Moderate and represents approximately 27% of all cases. Characteristics include the following:

- No vaginal bleeding to moderate vaginal bleeding
- Moderate-to-severe uterine tenderness with possible tetanic contractions
- Maternal tachycardia with orthostatic changes in blood pressure and heart rate
- Fetal distress
- Hypofibrinogenemia (i.e., 50–250 mg/dL)

Class 3: Severe and represents approximately 24% of all cases. Characteristics include the following:

- No vaginal bleeding to heavy vaginal bleeding
- Very painful tetanic uterus
- Maternal shock
- Hypofibrinogenemia (i.e., <150 mg/dL)
- Coagulopathy
- Fetal death

Prevention

Although the risk of placental abruption cannot be eliminated, it can be reduced.

- Avoiding tobacco, alcohol and cocaine during pregnancy decreases the risk.
- Staying away from activities which have a high risk of physical trauma is also important.
- Women who have high blood pressure or who have had a previous placental abruption and want to conceive must be closely supervised by a doctor.
- The risk of placental abruption can be reduced by maintaining a good diet including taking folate, regular sleep patterns and correction of pregnancy-induced hypertension.
- Use of aspirin before 16 weeks of pregnancy to prevent pre-eclampsia also appears effective at preventing placental abruption.

Management

Treatment depends on the amount of blood loss and the status of the fetus.

- If the fetus is less than 36 weeks, and neither mother nor fetus are in any distress, then they may be monitored in hospital until a change in condition or fetal maturity whichever comes first.
- Immediate delivery of the fetus may be indicated if the fetus is mature or if the fetus or mother is in distress.
- Blood volume replacement to maintain blood pressure and blood plasma replacement to maintain fibrinogen levels may be needed.
- Vaginal birth is usually preferred over CS unless there is fetal distress. Caesarean section carries an increased risk in cases of disseminated intravascular coagulation. People should be monitored for 7 days for postpartum hemorrhage. Excessive bleeding from uterus may necessitate hysterectomy.

Other Placental Abnormalities

1. ***Multiple Placentas***
   - *Placenta Bipartita* - not completely divided into lobes
   - *Placenta Duplex* - separated into parts
2. ***Succenturiate Placenta*** - with accessory lobe
3. ***Ring Shaped Placenta*** - associated with fetal growth retardation, post-partum and antepartum bleeding
4. ***Fenestrated Placenta*** - central portion of the maternal side is missing

5. ***Extrachorial Placenta*** **-** chorionic plate is smaller than the basal plate
   - *Circumvallate* **-** fetal surfaces presents a central depression surrounded by thickened white grayish ring
   - *Circummarginate* **-** white grayish ring is located at the margin of the placenta
6. ***Membraceous Placenta/Placenta Diffusa*** **-** fetal membrane covered by functioning villi
7. ***Large Placenta*** **-** associated with syphilis and erythroblastosis fetalis.
8. ***Placental Polyp*** **-** retained placenta that becomes a polyp may be covered by regenerated endometrium
9. ***Abnormally Adherent Placenta*** **-** the placenta is implanted in a thin and poorly formed deciduas
   - *Placenta Accreta* **-** attach to the myometrium
   - *Placenta Increta* **-** invade deeply in the myometrium
   - *Placenta Percreta* **-** invade the myometrium, perimetrium, and the bladder.
10. ***Placental Infection*** **-**
11. ***Placental Insufficiency*** **-** reduced placental function.

VIII. PREMATURE RUPTURE OF MEMBRANES

- Is a breakage of the amniotic sac before the onset of labor.
- If it occurs before 37 weeks it is known as preterm PROM otherwise it is known as term PROM.

Signs and Symptoms

- Most women will experience a painless leakage of fluid out of the vagina. They may notice either a distinct "gush" or a steady flow of small amounts of watery fluid in the absence of steady uterine contractions.
- Loss of fluid may be associated with the baby becoming easier to feel through the belly (due to the loss of the surrounding fluid), decreased uterine size, or meconium (fetal stool) seen in the fluid.

Risk Factors

- The cause of PROM is not clearly understood, but the following are risk factors that increase the chance of it occurring. In many cases, however, no risk factor is identified.
  - Infections: urinary tract infection, sexually transmitted diseases, lower genital tract infections (e.g. bacterial vaginosis), infections within the amniotic sac membranes (chorioamnionitis)
  - Tobacco use during pregnancy
  - Illicit drug use during pregnancy
  - Having had PROM or preterm delivery in previous pregnancies
  - Polyhydramnios: too much amniotic fluid
  - Multiple gestation: being pregnant with two or more fetuses at one time
  - Having had episodes of bleeding anytime during the pregnancy
  - Invasive procedures (e.g. amniocentesis)
  - Nutritional deficits
  - Cervical insufficiency: having a short or prematurely dilated cervix during pregnancy
  - Low socioeconomic status
  - Being underweight

Diagnosis

To confirm if a woman has experienced PROM, a health care clinician must prove that the fluid leaking from the vagina is amniotic fluid, and that labor has not yet started. To do this, a careful medical history

is taken, a gynecological exam is conducted using a sterile speculum, and an ultrasound of the uterus is performed.

- ***History***: a person with PROM typically recalls a sudden "gush" of fluid loss from the vagina, or steady loss of small amounts of fluid.
- ***Sterile speculum exam***: a clinician will insert a sterile speculum into the vagina in order to see inside and perform the following evaluations. Digital cervical exams, in which gloved fingers are inserted into the vagina to measure the cervix, are avoided until the women is in active labor to reduce the risk of infection.
- ***Pooling test***: Pooling is when a collection of amniotic fluid can be seen in the back of the vagina (vaginal fornix). Sometimes leakage of fluid from the cervical opening can be seen when the person coughs or performs a valsalva maneuver.
- ***Nitrazine test***: A sterile cotton swab is used to collect fluid from the vagina and place it on nitrazine (phenaphthazine) paper. Amniotic fluid is mildly basic (pH 7.1–7.3) compared to normal vaginal secretions which are acidic (pH 4.5–6).Basic fluid, like amniotic fluid, will turn the nitrazine paper from orange to dark blue.
- ***Fern test***: A sterile cotton swab is used to collect fluid from the vagina and place it on a microscope slide. After drying, amniotic fluid will form crystallization pattern called arborization which resembles leaves of a fern plant when viewed under a microscope.
- Fibronectin and alpha-fetoprotein blood tests

Classification

- PROM: when the fetal membranes rupture early, at least one hour before labor has started.
- Prolonged PROM: a case of PROM in which more than 18 hours has passed between the rupture and the onset of labor.
- Preterm (PPROM): PROM that occurs before 37 weeks gestation.
- Mid-trimester PPROM or pre-viable PPROM: PROM that occurs before 24 weeks' gestation. Before this age, the fetus cannot survive outside of the mother's womb.

Prevention

- Women who have had PROM are more likely to experience it in future pregnancies.
- There is not enough data to recommend a way to specifically prevent future PROM.
- However, any woman that has had a history of preterm delivery, because of PROM or not, is recommended to take progesterone supplementation to prevent recurrence.

Management

SUMMARY	FETAL AGE	MANAGEMENT
Term	> 37 weeks	• Induction of labor • Antibiotics PRN to prevent group B streptococcus (GBS) transmission
Late pre-term	34–36 weeks	• Same as for term
Preterm	24–33 weeks	• Watchful waiting (expectant management) • Tocolytics to prevent the beginning of labor • Magnesium sulfate infusion for 24-48 hours to allow maximum efficacy of corticosteroids for fetal lungs and also confer benefit to fetal brain and gut before delivery. • One time dose of corticosteroids (2 separate administrations, 12-24 hours apart before 34 weeks • Antibiotics if needed to prevent GBS transmission
Pre-viable	< 24 weeks	• Discussion of watchful waiting or induction of labor • No antibiotics, corticosteroids, tocolysis, or magnesium sulfate

Complication

- Complications in the baby may include premature birth, cord compression, and infection.
- Complications in the mother may include placental abruption and postpartum endometritis.

Chorioamnionitis

- A bacterial infection of the fetal membranes, which can be life-threatening to both mother and fetus.
- Women with PROM at any age are at high risk of infection because the membranes are open and allow bacteria to enter.
- Women are checked often (usually every 4 hours) for signs of infection: fever (more than 38 °C or 100.5 °F), uterine pain, maternal tachycardia, fetal tachycardia, or foul-smelling amniotic fluid.
- Elevated white blood cells are not a good way to predict infection because they are normally high in labor.
- If infection is suspected, artificial induction of labor is started at any gestational age and broad antibiotics are given. Caesarean section should not be automatically done in cases of infection, and should only be reserved for the usual fetal emergencies.

IX. PREGNANCY-INDUCED HYPERTENSION (PIH)

- **Gestational hypertension** is the development of new hypertension (systolic above 145 or diastolic above 95 mmHg) in a pregnant woman after 20 weeks' gestation without the presence of protein in the urine or other signs of pre-eclampsia.
- Hypertension is defined as having a blood pressure greater than 140/90 mm Hg.

Signs and Symptoms

High blood pressure is the major sign in diagnosing gestational hypertension. Some women with gestational hypertension may present asymptomatic, but a number of symptoms are associated with the condition.

Symptoms

- Edema
- Sudden weight gain
- Blurred vision or sensitivity to light
- Nausea and vomiting
- Persistent headaches
- Increased blood pressure

Risk Factors

Maternal Causes

- Obesity
- Mothers under 20 or over 40 years old
- Past history of DM, hypertension (particularly gestational hypertension) and renal disease
- Pre-existing hypertension
- Thrombophilias (anti-phospholoipid syndrome, protein C/S deficiency, factor V Leiden)
- Having donated a kidney

Pregnancy

- Multiple gestation (twins or triplets, etc.)
- Placental abnormalities:
  - Hyperplacentosis: Excessive exposure to chorionic villi
  - Placental ischemia

Family History

- Family history of pre-eclampsia
- African American race

Diagnosis – Conditions

There exist several hypertensive states of pregnancy:

- ***Gestational Hypertension* –** usually defined as having a BP >140/90 measured on two separate occasions, >6 hours apart, no presence of protein in the urine and diagnosed after 20 weeks of AOG.
- ***Pre-eclampsia* –** is gestational hypertension plus proteinuria (>300 mg of protein in a 24-hour urine sample). Severe pre-eclampsia involves a blood pressure greater than 160/110, with additional medical signs and symptoms. HELLP syndrome is a type of pre-eclampsia. It is a combination of three medical conditions: ***Hemolytic anemia, Elevated Liver*** enzymes and ***Low Platelet*** count.
- ***Eclampsia* –** This is when tonic-clonic seizures appear in a pregnant woman with high blood pressure and proteinuria.

Pre-eclampsia and eclampsia are sometimes treated as components of a common syndrome.

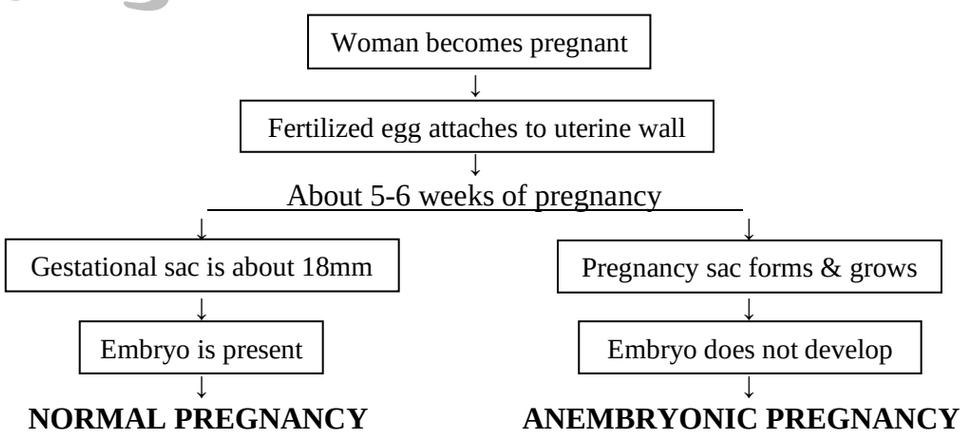
Treatment

There is no specific treatment, but is monitored closely to rapidly identify pre-eclampsia and its life-threatening complications (HELLP syndrome and eclampsia).

- Drug treatment options are limited, as many anti-hypertensives may negatively affect the fetus. Methyldopa, hydralazine, and labetalol are most commonly used for severe pregnancy hypertension.
- The fetus is at increased risk for a variety of life-threatening conditions, including pulmonary hypoplasia (immature lungs).
- If the dangerous complications appear after the fetus has reached a point of viability, even though still immature, then an early delivery may be warranted to save the lives of both mother and baby.
- An appropriate plan for labor and delivery includes selection of a hospital with provisions for advanced life support of newborn babies.

X. BLIGHTED OVUM

- Occurs when a fertilized egg implants in the uterus but does not develop into an embryo.
- Referred to as an **Anembryonic** (no embryo) pregnancy and is a leading cause of early pregnancy failure or miscarriage.
- Often, it occurs so early that you don't even know you are pregnant.
- Causes about 1 out of 2 miscarriages in the first trimester of pregnancy.



Causes

- Miscarriages from a blighted ovum are often due to problems with chromosomes, the structures that carry genes.
- This may be from a poor-quality sperm or egg.
- It may occur due to abnormal cell division. Regardless, your body stops the pregnancy because it recognizes this abnormality.

It's important to understand that the mother does not cause the miscarriage, it is unpreventable. For most women, a blighted ovum occurs only once.

Signs

- With blighted ovum, woman may have had a positive pregnancy test or missed period.
- There may also be signs of miscarriage, such as:
  - Abdominal cramps
  - Vaginal spotting or bleeding
  - A period that is heavier than usual

If any of these signs or symptoms are present, one may be having a miscarriage. But not all bleeding in the first trimester ends in miscarriage. So be sure to see the doctor right away if any of these signs are present.

Diagnosing

- Many women with blighted ovum think they have normal pregnancy because their HCG levels may increase. The placenta produces this hormone after implantation.
- With blighted ovum, HCG can continue to rise because the placenta may grow for a brief time, even when an embryo is not present.

For this reason, an ultrasound is usually needed to diagnose a blighted ovum - to confirm that the pregnancy sac is empty.

What Happens After a Miscarriage?

- If diagnosed with blighted ovum, discuss with doctor what to do next.
- Some undergo D and C. It may also be helpful if you want a pathologist to examine tissues to confirm the reason for the miscarriage.
- Using a medication such as Misoprostol on an outpatient basis may be another option. However, it may take several days to expel all tissue. This medication may have more bleeding and side effects. With both options, you may have pain or cramping that can be treated.
- Other women choose to let their body pass the tissue by itself. This is a personal decision, but needs discussion with the doctor.

Prevention

- Unfortunately, in most cases a blighted ovum cannot be prevented.
- Some seek out genetic testing if multiple early pregnancy losses occur. A blighted ovum is often a onetime occurrence, and rarely will a woman experience more than one.
- Most doctors recommend to wait at least 1-3 regular menstrual cycles before trying to conceive again after any type of miscarriage.