

## Abortion (Spontaneous or Induced)

### Definition:

- **Abortion** is the **loss of pregnancy before 20 weeks** of gestation.

### Types:

1. **Threatened abortion** – Vaginal bleeding but cervix is closed; may or may not lead to pregnancy loss.
2. **Inevitable abortion** – Vaginal bleeding with **cervical dilation**; miscarriage is inevitable.
3. **Incomplete abortion** – Some products of conception are expelled, but **parts remain** in the uterus.
4. **Complete abortion** – All products of conception are expelled; bleeding usually stops.
5. **Missed abortion** – Fetus dies but is **retained** in the uterus; may lead to infection or DIC if untreated.
6. **Recurrent abortion** – Three or more consecutive spontaneous abortions.

### Risk Factors:

- Chromosomal abnormalities, maternal infections, chronic diseases (like diabetes or thyroid disorders), trauma, advanced maternal age, uterine anomalies.

### Signs & Symptoms:

- Vaginal bleeding, abdominal cramping, backache, possible passage of tissue.

### Nursing Care:

- **Assess bleeding** and vital signs.
- **Monitor pain** and emotional support.
- Educate on **signs of complications** (heavy bleeding, fever, foul odor).
- Provide **referrals for counseling** if needed.

**Key Point:** Early recognition and supportive care are crucial.

## Ectopic Pregnancy

### Definition:

- Implantation of the fertilized ovum **outside the uterus**, most commonly in the **fallopian tube**.

### Risk Factors:

- Pelvic inflammatory disease (PID), prior ectopic pregnancy, tubal surgery, IUD use, advanced maternal age, infertility treatments.

### Signs & Symptoms:

- Missed period, **vaginal spotting**, **lower abdominal pain** (usually one-sided).
- **Ruptured ectopic:** sudden severe abdominal pain, shoulder pain (from diaphragmatic irritation), hypotension, tachycardia – **emergency!**

### Diagnosis:

- **Transvaginal ultrasound** (absence of intrauterine pregnancy).
- **hCG levels** (lower than expected for gestational age).

### Treatment:

- **Medical:** Methotrexate for unruptured ectopic.
- **Surgical:** Salpingectomy or salpingostomy for ruptured or unstable patients.

### Nursing Care:

- Monitor vital signs and **watch for shock**.
- Emotional support for loss of pregnancy.
- Pre- and post-operative care and education on future pregnancy risks.

**Key Point:** Early detection is critical to prevent rupture and life-threatening hemorrhage.

## Gestational Trophoblastic Disease (GTD)

### Definition:

- Abnormal proliferation of **trophoblastic tissue** (cells that normally form the placenta).
- Includes: **Hydatidiform mole (complete or partial)**, **invasive mole**, **choriocarcinoma**.

### Risk Factors:

- Extreme maternal age (<20 or >40), previous molar pregnancy, prior miscarriage.

### Signs & Symptoms:

- Vaginal bleeding (dark brown “prune juice” color), **rapid uterine enlargement**, **severe nausea and vomiting**, high **hCG levels**, absence of fetal heart tones.

### Complications:

- Heavy bleeding, **preeclampsia** before 20 weeks, risk of **malignancy** (choriocarcinoma).

### Diagnosis:

- **Ultrasound:** “Snowstorm” pattern.
- **hCG levels:** Abnormally high for gestational age.

### Treatment:

- **Evacuation of the mole** (suction curettage).
- **Follow-up hCG monitoring** to detect persistent disease.
- Chemotherapy if malignant GTD develops.

### Nursing Care:

- Monitor bleeding, vital signs, and emotional support.
- Educate patient to **avoid pregnancy** during hCG follow-up (usually 6–12 months).
- Support for coping with loss and fear of malignancy.

**Key Point:** Early detection and careful follow-up are essential to prevent complications and ensure future fertility.

## Placenta Previa

### Definition:

- Placenta implants **low in the uterus**, covering part or all of the **cervical opening (os)**.

### Types:

1. **Complete:** Placenta completely covers cervical os.
2. **Partial:** Placenta partially covers cervical os.
3. **Marginal:** Placenta reaches the edge of cervical os.
4. **Low-lying:** Placenta implanted near but not reaching cervical os.

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**Risk Factors:**

- Previous placenta previa, cesarean birth, multiple pregnancies, advanced maternal age, smoking, previous uterine surgery.

**Signs & Symptoms:**

- **Painless, bright red vaginal bleeding** in the third trimester.
- Bleeding may be sudden and recurrent.
- Fetal position may be abnormal (breech or transverse).

**Complications:**

- Maternal: hemorrhagic shock, anemia.
- Fetal: preterm birth, malpresentation, growth restriction.

**Diagnosis:**

- **Ultrasound** (transabdominal or transvaginal).
- Avoid vaginal exams if placenta previa is suspected (risk of provoking bleeding).

**Treatment:**

- **Hospitalization** for monitoring if bleeding occurs.
- **Bed rest** and pelvic rest.
- **Cesarean delivery** is usually required for complete or partial previa.
- Blood transfusion if significant hemorrhage occurs.

**Nursing Care:**

- Monitor **vital signs, bleeding, and fetal heart rate**.
- Provide **emotional support** due to activity restriction or hospitalization.
- Educate patient on **avoiding vaginal exams, sexual intercourse, or strenuous activity**.

**Key Point:** Placenta previa = **painless third-trimester bleeding** and **C-section delivery**.

**Abruptio Placenta (Placental Abruption)**

**Definition:**

- Premature **separation of the placenta** from the uterine wall **after 20 weeks**, before delivery.

**Risk Factors:**

- Maternal hypertension, preeclampsia, trauma (fall, car accident), smoking, cocaine use, previous abruption, multiple pregnancies.

**Signs & Symptoms:**

- **Sudden, intense abdominal pain** or uterine tenderness.
- **Dark red vaginal bleeding** (may be concealed behind placenta).
- Uterine **rigidity**, contractions, back pain.
- Fetal distress may occur due to compromised blood flow.

**Complications:**

- Maternal: hemorrhagic shock, DIC, renal failure.
- Fetal: hypoxia, preterm birth, stillbirth.

**Diagnosis:**

- Primarily **clinical** (pain + bleeding + uterine tenderness).
- **Ultrasound** may help, but a normal scan does **not rule out** abruption.

**Treatment:**

- **Immediate hospitalization.**
- **Stabilize mother:** IV fluids, blood transfusion if needed.
- **Delivery:** usually **emergency cesarean** if fetus is alive and mother unstable; vaginal delivery may be considered if stable and fetus deceased.

**Nursing Care:**

- Continuous **monitoring of maternal vitals and fetal status**.
- Prepare for **emergency delivery** if indicated.
- Emotional support due to sudden onset and potential fetal loss.
- Educate high-risk women on **signs to report immediately** (abdominal pain, vaginal bleeding).

**Key Point:** Abruptio placenta = **painful third-trimester bleeding**, often with uterine tenderness and fetal distress, **medical emergency**.

**Disseminated Intravascular Coagulation (DIC)**

**Definition:**

A serious, life-threatening condition in which the **body's normal clotting mechanisms become abnormally activated**, leading to both **widespread clot formation** and **bleeding** due to consumption of clotting factors and platelets. It is not a primary disease but usually a **complication of another underlying condition**.

**Pathophysiology**

1. **Triggering event** (e.g., sepsis, trauma, malignancy, obstetric complications) activates the coagulation cascade.
2. **Excessive clot formation** occurs in small blood vessels (microthrombi), which can lead to **organ ischemia**.
3. **Consumption of platelets and clotting factors** occurs, resulting in **bleeding** (from IV sites, mucous membranes, GI tract).
4. **Fibrinolysis** is activated, worsening bleeding.

**Common Causes**

- **Sepsis** (especially gram-negative bacteria)
- **Obstetric complications** (placental abruption, amniotic fluid embolism, postpartum hemorrhage)
- **Severe trauma or burns**
- **Malignancies** (especially acute promyelocytic leukemia)
- **Major surgery or transfusion reactions**

**Clinical Manifestations**

- **Bleeding:** oozing from IV sites, mucosal bleeding, hematuria, GI bleeding, ecchymoses.
- **Thrombosis:** organ dysfunction (kidneys, liver, lungs, CNS) due to microvascular clots.
- **Other signs:** hypotension, tachycardia, shock (if underlying cause severe).

**Laboratory Findings**

- **Platelets:** low (thrombocytopenia)
- **Prothrombin time (PT) and aPTT:** prolonged

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- **Fibrinogen:** decreased
- **D-dimer and fibrin degradation products (FDPs):** elevated
- **Peripheral smear:** schistocytes (fragmented RBCs)

### Management

1. **Treat underlying cause** (e.g., antibiotics for sepsis, control obstetric hemorrhage).
2. **Supportive care:**
  - **Blood products:** platelets, fresh frozen plasma, cryoprecipitate as needed.
  - **Maintain hemodynamic stability:** IV fluids, vasopressors if needed.
3. **Monitor labs closely** to guide transfusions and detect organ dysfunction.
4. **Anticoagulation** (e.g., heparin) may be considered in **chronic DIC with predominant thrombosis**, but is usually avoided in acute bleeding.

### Key Points

- DIC is a **medical emergency** with high mortality.
- It represents a paradox of **simultaneous clotting and bleeding**.
- **Early recognition and treatment of the underlying cause** are critical to survival.

## Disseminated Intravascular Coagulation (DIC) in Pregnancy

### Pathophysiology in Pregnancy

1. **Triggering obstetric event** → massive release of tissue factor (from placenta, amniotic fluid, or injured endothelium).
2. **Activation of coagulation cascade** → formation of microthrombi in small vessels.
3. **Consumption of platelets and clotting factors** → bleeding tendency.
4. **Fibrinolysis activation** → further bleeding.

### Common Obstetric Causes

- **Placental abruption** (most common)
- **Amniotic fluid embolism**
- **Severe preeclampsia/eclampsia**
- **Postpartum hemorrhage**
- **Septic abortion or chorioamnionitis**
- **Retained dead fetus syndrome** (rare)

### Clinical Features

- **Bleeding:** vaginal, from IV sites, mucous membranes, or postpartum hemorrhage
- **Signs of shock:** hypotension, tachycardia
- **Organ dysfunction:** renal failure, hepatic involvement, respiratory distress (from microthrombi)
- **Skin changes:** petechiae, ecchymoses

### Laboratory Findings

- **Platelets:** ↓ (thrombocytopenia)
- **PT & aPTT:** prolonged
- **Fibrinogen:** ↓ (especially concerning in pregnancy)
- **D-dimer / FDP:** ↑
- **Peripheral smear:** schistocytes (RBC fragments)

**Note:** In pregnancy, a **fibrinogen level <200 mg/dL** is highly suggestive of DIC.

### Management

1. **Treat the underlying obstetric cause immediately**
  - Deliver the fetus if indicated (placental abruption, amniotic fluid embolism).
  - Manage sepsis aggressively with antibiotics.
  - Control postpartum hemorrhage.
2. **Supportive therapy**
  - **Blood products:**
    - Platelets for thrombocytopenia
    - Fresh frozen plasma for clotting factor replacement
    - Cryoprecipitate for low fibrinogen
  - **Volume resuscitation:** IV fluids, transfusions
  - **Vasopressors** if hypotensive
3. **Monitor labs and vital signs closely** for early detection of ongoing coagulation abnormalities.

### Key Points in Pregnancy

- DIC is a **medical emergency** with high maternal and fetal morbidity/mortality.
- Obstetric triggers are usually **placental-related**.
- **Early recognition and correction of the underlying cause** is the main determinant of survival.
- Laboratory monitoring is critical; **fibrinogen is a particularly important marker in pregnant women**.

## Hyperemesis Gravidarum (HG)

### Definition

- Persistent, **severe nausea and vomiting** during pregnancy
- Leading to **>5% pre-pregnancy weight loss, dehydration, ketonuria, and electrolyte disturbances**

### Epidemiology

- Occurs in **0.3–3% of pregnancies**
- Most common in the **first trimester** (up to 12–14 weeks)
- More frequent in:
  - **First pregnancies (primigravida)**
  - **Multiple gestations**
  - History of HG in prior pregnancies
  - **Molar pregnancy** or gestational trophoblastic disease

### Etiology / Risk Factors

- Exact cause unknown; multifactorial:
  - **Hormonal:** high hCG, estrogen, thyroid hormone
  - **Genetic predisposition**
  - **Psychosocial factors** (stress, anxiety)
  - **Gastrointestinal disorders**

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### Clinical Features

- Persistent **nausea and vomiting** (beyond typical morning sickness)
- **Weight loss >5% of pre-pregnancy weight**
- **Signs of dehydration:** dry mucous membranes, decreased skin turgor, hypotension, tachycardia
- **Electrolyte imbalance:** hypokalemia, hyponatremia, metabolic alkalosis
- **Ketosis:** positive ketones in urine
- Fatigue, weakness, and rarely, hepatic or renal complications

### Diagnosis

- Based on **clinical history and examination**
- Laboratory findings:
  - **Electrolytes:** low Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup>
  - **Urinalysis:** ketonuria
  - **Thyroid function tests:** usually normal but may be slightly elevated in some cases
- Rule out other causes: gastroenteritis, hepatitis, cholecystitis, hyperthyroidism, molar pregnancy

### Management

#### 1. Supportive Care (first-line)

- **Hydration:** oral fluids if tolerated; IV fluids if severe
- **Electrolyte correction:** potassium, sodium, and chloride replacement
- **Nutritional support:** small, frequent meals; consider vitamin B6 supplementation

#### 2. Pharmacologic Therapy

- **Vitamin B6 (pyridoxine) ± doxylamine**
- **Antiemetics:**
  - Metoclopramide
  - Ondansetron (use with caution, consider guidelines)
- **Corticosteroids:** only if refractory to other treatment

#### 3. Severe Cases

- **Hospitalization** for IV fluids and monitoring
- **Enteral feeding** if unable to maintain oral intake
- **Parenteral nutrition** in extreme cases

### Nursing Care

- Monitor **vital signs, intake/output, weight, and laboratory values**
- Encourage **small, frequent meals and high-protein snacks**
- Provide **emotional support** for anxiety or stress
- Educate patient about **signs of dehydration and when to seek help**

### Complications

- Maternal: electrolyte imbalances, dehydration, Wernicke's encephalopathy (rare), renal or hepatic injury
- Fetal: generally minimal if maternal nutrition is maintained, but severe untreated HG can lead to low birth weight or preterm birth

### Key Points

- HG is **more severe than normal morning sickness**

- **Early intervention** prevents maternal and fetal complications
- Management is primarily **supportive**, with medications added as needed

### HELLP Syndrome

#### Definition:

HELLP stands for:

- **H**emolysis
- **E**levated Liver enzymes
- **L**ow Platelets

It is considered a **severe form of preeclampsia** and usually occurs in the **third trimester**, but can also appear postpartum.

#### Etiology / Risk Factors:

- Severe preeclampsia
- Multiparity
- Maternal age >25 years
- Previous history of HELLP

#### Pathophysiology:

- Endothelial dysfunction → microvascular injury → **hemolysis, platelet activation/consumption, and liver damage.**

#### Clinical Features:

- Right upper quadrant or epigastric pain
- Nausea, vomiting
- Malaise, fatigue
- Hypertension (may be mild)
- Jaundice (in severe cases)

#### Laboratory Findings:

- **Hemolysis:** elevated LDH, peripheral smear with schistocytes
- **Elevated liver enzymes:** AST, ALT
- **Low platelets:** <100,000/mm<sup>3</sup>

#### Management:

- **Stabilize mother:** antihypertensives, seizure prophylaxis with magnesium sulfate
- **Delivery of fetus:** definitive treatment (especially if >34 weeks or maternal/fetal compromise)
- **Supportive care:** blood transfusion, platelets, IV fluids

### Chronic Hypertension in Pregnancy

#### Definition:

- Hypertension **present before pregnancy or diagnosed before 20 weeks gestation.**

#### Etiology / Risk Factors:

- Primary hypertension (essential)
- Secondary causes: renal disease, endocrine disorders

#### Clinical Features:

- Often asymptomatic
- May develop **superimposed preeclampsia**

#### Management:

- **Close monitoring:** BP, urine protein, fetal growth
- **Antihypertensives safe in pregnancy:** methyldopa, labetalol, nifedipine
- Avoid ACE inhibitors and ARBs

## RH Incompatibility

### Definition:

- Maternal **Rh-negative** blood with fetal **Rh-positive** blood → maternal antibodies develop against fetal RBCs

### Pathophysiology:

- First pregnancy: sensitization may occur, usually no effect
- Subsequent pregnancies: maternal antibodies cross placenta → **hemolysis of fetal RBCs** → **hemolytic disease of the newborn (HDN)**

### Prevention / Management:

- **Rh immunoglobulin (RhoGAM)**: given at 28 weeks and postpartum if baby Rh-positive
- Monitor fetal hemoglobin, bilirubin, and anemia

### Clinical Features in fetus/newborn:

- Jaundice, anemia, hepatosplenomegaly, hydrops fetalis in severe cases

## ABO Incompatibility

### Definition:

- Maternal **blood type O** with fetal **blood type A, B, or AB** → maternal antibodies may attack fetal RBCs

### Pathophysiology:

- Typically, mild because anti-A and anti-B antibodies are **IgM**, which do not cross the placenta easily
- Rarely severe hemolytic disease occurs

### Management:

- Usually supportive: phototherapy for jaundice
- Rarely requires exchange transfusion

## Diabetes Mellitus (DM) in Pregnancy

### Types of Diabetes in Pregnancy

#### 1. Pre-existing Diabetes (Type 1 or Type 2)

- Present before pregnancy.
- Often requires **tighter glucose control** and **increased insulin needs** during pregnancy.
- Higher risk of congenital anomalies because glucose may have been high during **organ development (first trimester)**.

#### 2. Gestational Diabetes Mellitus (GDM)

- Glucose intolerance **first discovered during pregnancy**.
- Usually appears around **24–28 weeks**.
- Often resolves after birth, but increases long-term risk of Type 2 diabetes.

### Risk Factors for GDM

- Obesity / overweight
- Family history of diabetes
- Previous GDM
- Previous large baby (macrosomia >4 kg)
- Polycystic ovary syndrome (PCOS)
- Maternal age >25–30
- Hypertension

### Signs & Symptoms

Often there are **no obvious symptoms**, which is why screening is important.

When symptoms are present, they include:

- Excessive thirst (polydipsia)
- Frequent urination (polyuria)
- Fatigue
- Recurrent infections

### Diagnosis

#### Screening at 24–28 weeks

- **Glucose Challenge Test (GCT)**: drink 50g glucose → check blood sugar after 1 hr.
- If elevated → **Oral Glucose Tolerance Test (OGTT)** for confirmation.

### Maternal Complications

- **Preeclampsia**
- **Polyhydramnios** (too much amniotic fluid)
- **Increased infections** (UTIs, yeast)
- **Preterm labor**
- **Ketoacidosis** (especially in Type 1)
- Higher risk for **C-section**

### Fetal & Newborn Complications

#### If glucose is not well controlled:

- **Macrosomia** (big baby; >4 kg), leading to:
  - Shoulder dystocia
  - Birth trauma
- **Hypoglycemia right after birth** (because the baby made extra insulin in utero but supply is suddenly cut)
- **Respiratory distress syndrome**
- **Stillbirth** (in severe unmanaged cases)
- **Congenital anomalies** (only in pre-existing diabetes)

#### Key point:

**Maternal hyperglycemia** → fetal **hyperinsulinemia** → fetal **overgrowth and complications**.

### Management

#### 1. Diet Therapy

First-line treatment for GDM:

- Balanced meals with controlled carbohydrates.
- Small frequent meals.
- Avoid sugary drinks and simple carbs.

#### 2. Exercise

- Helps increase insulin sensitivity.
- Safe activities: walking, swimming, prenatal yoga.

#### 3. Blood Glucose Monitoring

Typical goals:

- Fasting: **70–95 mg/dL**
- 1-hour post-meal: **<140 mg/dL**
- 2-hour post-meal: **<120 mg/dL**

#### 4. Medications (if needed)

- **Insulin** is preferred because it doesn't cross the placenta.
- Some cases may use oral meds (metformin), but insulin is most common in Pillitteri's framework.

#### 5. Fetal Monitoring

- Ultrasounds for fetal growth.
- NSTs and BPPs if poorly controlled.

### ***Intrapartum (Labor) Considerations***

- Keep maternal glucose around **80–100 mg/dL** to reduce newborn hypoglycemia.
- Continuous glucose monitoring.
- Insulin may be given via IV if necessary.

### **Postpartum**

- Insulin needs **drop suddenly** after birth.
- GDM usually resolves, but:
  - Mothers require **6–12 week postpartum glucose testing**.
  - Increased lifelong risk for Type 2 diabetes.
  - Encourage healthy lifestyle changes.

### **Nursing Responsibilities**

- ✓ Assess blood glucose and teach self-monitoring
- ✓ Teach diet and exercise modifications
- ✓ Review signs of hyper- and hypoglycemia
- ✓ Monitor fetal growth and well-being
- ✓ Prepare patient for possible insulin therapy
- ✓ Provide emotional support and education
- ✓ Emphasize postpartum follow-up testing

### **“High sugar makes BIG babies and BIG problems.”**

- **Big baby (macrosomia)**
- **Big placenta (polyhydramnios)**
- **Big insulin from baby (neonatal hypoglycemia)**

### **Obesity in Pregnancy**

Obesity in pregnancy refers to excessive body fat in a woman before or during pregnancy, commonly defined using Body Mass Index (BMI). A BMI of **≥30 kg/m<sup>2</sup>** is classified as obese. Maternal obesity is a significant public health concern because it increases the risk of complications for both the mother and the fetus throughout pregnancy, labor, delivery, and the postpartum period.

### **Risk Factors**

- Pre-pregnancy obesity or excessive weight gain during pregnancy
- Sedentary lifestyle
- Poor dietary habits (high-calorie, high-fat intake)
- Genetic predisposition
- Low socioeconomic status
- Advanced maternal age
- Polycystic ovary syndrome (PCOS)
- Previous history of obesity-related pregnancy complications

### **Pathophysiology**

Obesity leads to **chronic low-grade inflammation**, insulin resistance, and altered lipid metabolism. During pregnancy, these changes are exacerbated due to increased metabolic demands. Excess adipose tissue produces inflammatory cytokines and hormones (e.g., leptin), contributing to:

- Impaired glucose tolerance → gestational diabetes mellitus (GDM)

- Increased blood volume and cardiac workload → hypertensive disorders
- Altered placental function → fetal overgrowth (macrosomia) or growth restriction

### **Clinical Manifestations and Signs and Symptoms**

#### **Maternal Manifestations:**

- Excessive gestational weight gain
- Fatigue and shortness of breath
- Hypertension or preeclampsia
- Gestational diabetes mellitus
- Increased incidence of cesarean delivery
- Postpartum hemorrhage and infection

#### **Fetal/Neonatal Manifestations:**

- Macrosomia (large-for-gestational-age infant)
- Birth injuries (e.g., shoulder dystocia)
- Preterm birth
- Congenital anomalies (e.g., neural tube defects)
- Increased risk of childhood obesity and metabolic disorders

#### **Medical Management**

- Preconception counseling and weight optimization
- Regular prenatal visits with close monitoring
- Individualized weight gain recommendations based on BMI
- Screening and early detection of GDM and hypertensive disorders
- Nutritional counseling and physical activity guidance
- Planned delivery approach (anticipation of complications)

#### **Nursing Intervention**

- Monitor maternal weight, blood pressure, and blood glucose levels
- Provide education on healthy nutrition and appropriate physical activity
- Encourage adherence to prenatal care and scheduled screenings
- Support lifestyle modifications in a nonjudgmental manner
- Monitor fetal growth and well-being
- Prepare for potential labor and delivery complications
- Provide postpartum support, including breastfeeding encouragement and weight management education

#### **Drug Intervention and Nursing Considerations**

##### **Common Medications:**

- **Insulin or oral hypoglycemic agents** (for gestational diabetes)
- **Antihypertensive medications** (e.g., labetalol, methyldopa)
- **Low-dose aspirin** (in high-risk patients to prevent preeclampsia)

##### **Nursing Considerations:**

- Monitor maternal and fetal response to medications
- Educate the patient on medication purpose, dosage, and side effects

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- Assess for adverse effects and drug interactions
- Reinforce adherence to prescribed treatment plans
- Ensure medications used are safe in pregnancy

### Important Notes to Remember

- Obesity increases both maternal and fetal morbidity and mortality.
- Weight loss is **not recommended during pregnancy**, but controlled weight gain is essential.
- Early intervention and multidisciplinary care improve outcomes.
- Emotional support and patient-centered education are critical.
- Postpartum follow-up is important to reduce long-term health risks for both mother and child.

### Anemia in Pregnancy

Anemia in pregnancy is a condition characterized by a decreased concentration of hemoglobin or red blood cells, resulting in reduced oxygen-carrying capacity of the blood. According to the World Health Organization (WHO), anemia in pregnancy is defined as **hemoglobin <11 g/dL**. It is most commonly caused by **iron deficiency**, though folate deficiency, vitamin B12 deficiency, and hemoglobinopathies may also contribute. Anemia during pregnancy poses significant risks to both the mother and fetus.

### Risk Factors

- Inadequate dietary intake of iron, folate, or vitamin B12
- Increased iron requirements during pregnancy
- Short interpregnancy intervals
- Multiple pregnancies (e.g., twins or triplets)
- Chronic blood loss (e.g., parasitic infections, gastrointestinal bleeding)
- Low socioeconomic status
- Adolescent pregnancy
- History of anemia or heavy menstrual bleeding
- Malabsorption disorders

### Pathophysiology (If Applicable)

During pregnancy, plasma volume increases by approximately **40–50%**, while red blood cell mass increases by only **20–30%**, leading to **physiologic (dilutional) anemia**. When nutritional intake is insufficient, iron stores are depleted, resulting in impaired hemoglobin synthesis. Reduced hemoglobin levels decrease oxygen delivery to maternal tissues and the placenta, leading to maternal fatigue and compromised fetal growth.

### Clinical Manifestations and Signs and Symptoms

#### Maternal Manifestations:

- Fatigue and weakness
- Pallor of skin and mucous membranes
- Dizziness or lightheadedness

- Shortness of breath
- Palpitations or tachycardia
- Headache
- Reduced exercise tolerance

#### Fetal/Neonatal Manifestations:

- Intrauterine growth restriction (IUGR)
- Preterm birth
- Low birth weight
- Increased perinatal mortality
- Neonatal anemia

### Medical Management

- Routine screening of hemoglobin/hematocrit during prenatal visits
- Identification of underlying cause of anemia
- Dietary counseling to increase iron-rich foods
- Oral iron supplementation (first-line treatment)
- Parenteral iron therapy for severe or refractory cases
- Blood transfusion in cases of severe, symptomatic anemia

### Nursing Intervention

- Assess maternal signs and symptoms of anemia
- Monitor laboratory values (hemoglobin, hematocrit, ferritin levels)
- Educate the patient on proper intake of iron supplements
- Encourage consumption of iron-rich foods (e.g., red meat, leafy greens, legumes)
- Promote vitamin C intake to enhance iron absorption
- Instruct to avoid taking iron with calcium-rich foods or caffeine
- Monitor fetal growth and well-being
- Provide emotional support and reinforce adherence to treatment

### Drug Intervention and Nursing Considerations

#### Common Medications:

- **Oral iron supplements** (e.g., ferrous sulfate, ferrous gluconate)
- **Parenteral iron** (e.g., iron sucrose) for severe deficiency
- **Folic acid supplementation**
- **Vitamin B12** (if deficiency is present)

#### Nursing Considerations:

- Teach patients to take iron on an empty stomach if tolerated
- Inform about common side effects (nausea, constipation, dark stools)
- Encourage adequate fluid and fiber intake to prevent constipation
- Monitor for allergic reactions with IV iron
- Ensure correct dosage and compliance

### Important Notes to Remember

- Iron-deficiency anemia is the most common anemia in pregnancy.
- Early detection and treatment prevent maternal and fetal complications.
- Physiologic anemia is normal, but pathologic anemia requires intervention.

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- Untreated anemia increases the risk of postpartum hemorrhage and infection.
- Continued supplementation postpartum may be necessary.

### Types of Anemia in Pregnancy

Anemia in pregnancy is classified based on **cause, red blood cell morphology, and nutritional deficiency**. Each type has specific implications for maternal and fetal health.

#### 1. Iron Deficiency Anemia

##### Most common type in pregnancy

- **Cause:** Inadequate iron intake, increased iron demand, poor absorption
- **Pathophysiology:** Decreased hemoglobin synthesis due to iron depletion
- **Features:** Microcytic, hypochromic RBCs
- **Risks:** Preterm birth, low birth weight, postpartum hemorrhage

#### 2. Physiologic (Dilutional) Anemia of Pregnancy

- **Cause:** Increased plasma volume exceeds RBC mass expansion
- **Nature:** Normal adaptation, not pathological
- **Features:** Mild decrease in hemoglobin
- **Management:** Monitoring only

#### 3. Folate Deficiency Anemia

- **Cause:** Poor dietary intake, increased fetal demand
- **Features:** Macrocytic anemia
- **Risks:** Neural tube defects, preterm labor
- **Management:** Folic acid supplementation

#### 4. Vitamin B12 Deficiency Anemia

- **Cause:** Malabsorption, vegetarian diet, pernicious anemia
- **Features:** Macrocytic anemia, neurologic symptoms
- **Risks:** Fetal growth restriction, neurodevelopmental issues

#### 5. Hemolytic Anemia

- **Cause:** RBC destruction due to autoimmune disorders, infections, or drugs
- **Features:** Normocytic anemia, jaundice
- **Risks:** Fetal hypoxia, maternal complications

#### 6. Sickle Cell Anemia

##### Inherited hemoglobinopathy

- **Cause:** Abnormal hemoglobin S
- **Features:** Chronic hemolysis, vaso-occlusive crises
- **Risks:** Preterm labor, fetal growth restriction, maternal crisis

#### 7. Thalassemia

##### Genetic disorder of hemoglobin synthesis

- **Types:** Alpha and Beta thalassemia
- **Features:** Microcytic anemia unresponsive to iron
- **Risks:** Severe fetal anemia, hydrops fetalis (alpha-thalassemia)

#### 8. Aplastic Anemia

- **Cause:** Bone marrow failure
- **Features:** Pancytopenia
- **Risks:** Severe maternal and fetal complications
- **Management:** Specialized care, possible transfusion

#### 9. Anemia Due to Chronic Disease

- **Cause:** Chronic infections or inflammatory conditions
- **Features:** Normocytic or microcytic anemia
- **Management:** Treat underlying condition

### Infections in Pregnancy

Infections in pregnancy refer to bacterial, viral, parasitic, or fungal infections that occur during gestation and may adversely affect the health of the mother, fetus, or both. Pregnancy alters the maternal immune system, making women more susceptible to certain infections and increasing the risk of vertical (mother-to-child) transmission. Some infections can lead to serious maternal illness, congenital anomalies, preterm labor, or fetal loss.

#### Risk Factors

- Altered immune response during pregnancy
- Poor prenatal care
- Low socioeconomic status
- Poor hygiene and sanitation
- Malnutrition
- Multiple sexual partners or unprotected sexual activity
- Pre-existing chronic illnesses (e.g., diabetes, HIV)
- Exposure to infected individuals
- Consumption of contaminated food or water

#### Pathophysiology (If Applicable)

During pregnancy, the maternal immune system is partially suppressed to prevent rejection of the fetus. This immune modulation increases susceptibility to infections and may allow pathogens to cross the placenta or ascend from the lower genital tract. Infections can cause:

- **Inflammation of fetal membranes** → preterm labor
- **Placental infection** → impaired nutrient and oxygen transfer
- **Direct fetal infection** → congenital anomalies or fetal death

#### Clinical Manifestations and Signs and Symptoms

##### Maternal Manifestations:

- Fever and chills
- Fatigue and malaise
- Localized pain or discomfort (e.g., dysuria in UTIs)
- Abnormal vaginal discharge or bleeding
- Respiratory symptoms (cough, shortness of breath)
- Gastrointestinal symptoms (nausea, diarrhea)

##### Fetal/Neonatal Manifestations:

- Intrauterine growth restriction (IUGR)

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## NCM 109 2<sup>nd</sup> Semester SY 2025-2026

- Preterm birth
- Congenital infections and anomalies
- Low birth weight
- Neonatal sepsis or mortality

### Medical Management

- Early screening and diagnosis during prenatal care
- Laboratory tests (blood cultures, urine analysis, serology)
- Appropriate antimicrobial therapy based on organism and gestational age
- Monitoring maternal and fetal status
- Immunization when indicated (e.g., influenza, tetanus, Tdap)
- Hospitalization for severe infections

### Nursing Intervention

- Monitor maternal vital signs and symptoms of infection
- Educate on hygiene, handwashing, and infection prevention
- Encourage adherence to prescribed medications
- Monitor fetal heart rate and movement
- Provide education on safe food handling and avoidance of infection sources
- Support vaccination compliance
- Provide emotional support and reassurance

### Drug Intervention and Nursing Considerations

#### Common Medications:

- **Antibiotics** (e.g., penicillins, cephalosporins) considered safe in pregnancy
- **Antivirals** (e.g., acyclovir for herpes infections)
- **Antiparasitic agents** (e.g., for malaria or toxoplasmosis, when indicated)
- **Antipyretics** (e.g., acetaminophen for fever control)

#### Nursing Considerations:

- Verify drug safety category for pregnancy
- Monitor for adverse drug reactions
- Educate patient on completing full course of treatment
- Avoid contraindicated drugs (e.g., tetracyclines, fluoroquinolones)
- Assess maternal and fetal response to therapy

### Important Notes to Remember

- Early detection and treatment of infections reduce maternal and fetal complications.
- Some infections can be transmitted vertically and cause lifelong effects.
- Routine prenatal screening is essential.
- Patient education plays a critical role in prevention.
- Multidisciplinary care improves outcomes for high-risk pregnancies.

### Types of Infection

Infections during pregnancy can be classified based on **mode of transmission, affected system, and causative organism**. Some

infections pose minimal risk, while others can cause serious maternal and fetal complications.

### 1. TORCH Infections

These are infections that can be transmitted from mother to fetus and may cause congenital anomalies.

#### T – Toxoplasmosis

- Cause: *Toxoplasma gondii*
- Source: Undercooked meat, cat feces
- Effects: Hydrocephalus, chorioretinitis, intracranial calcifications

#### O – Other Infections

- Includes: Syphilis, Varicella, HIV, Hepatitis B
- Effects: Congenital anomalies, stillbirth, neonatal infection

#### R – Rubella

- Cause: Rubella virus
- Effects: Cataracts, deafness, congenital heart disease

#### C – Cytomegalovirus (CMV)

- Cause: Herpesvirus
- Effects: Hearing loss, intellectual disability, microcephaly

#### H – Herpes Simplex Virus (HSV)

- Cause: HSV-1 or HSV-2
- Effects: Neonatal herpes, skin/eye/mouth lesions, encephalitis

### 2. Sexually Transmitted Infections (STIs)

- **Syphilis** – Stillbirth, congenital syphilis
- **Gonorrhea** – Neonatal conjunctivitis, preterm labor
- **Chlamydia** – Neonatal pneumonia, conjunctivitis
- **HIV** – Vertical transmission without treatment
- **Human Papillomavirus (HPV)** – Rare neonatal transmission

### 3. Urinary Tract Infections (UTIs)

- **Asymptomatic bacteriuria**
- **Cystitis**
- **Pyelonephritis**

#### Complications:

- Preterm labor
- Low birth weight
- Maternal sepsis

### 4. Respiratory Infections

- **Influenza**
- **COVID-19**
- **Tuberculosis**

#### Risks:

- Severe maternal illness
- Fetal hypoxia
- Preterm birth

### 5. Gastrointestinal Infections

- **Listeriosis** (from unpasteurized dairy)
- **Salmonella**
- **Hepatitis A**

#### Complications:

- Miscarriage
- Stillbirth
- Neonatal sepsis

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## 6. Vector-Borne and Parasitic Infections

- Malaria
- Zika virus
- Dengue fever

### Complications:

- Severe anemia
- Fetal growth restriction
- Congenital defects (e.g., microcephaly with Zika)

## 7. Skin and Soft Tissue Infections

- Abscesses
- Cellulitis
- Fungal infections (e.g., candidiasis)

### Risks:

- Local discomfort
- Rare systemic spread

## 8. Group B Streptococcus (GBS) Infection

- Colonization in maternal genital tract
- Transmitted during labor

### Complications:

- Neonatal sepsis
- Pneumonia
- Meningitis

### Important Notes to Remember

- Many infections are **preventable with screening and education**.
- Routine prenatal tests help detect infections early.
- Some infections are **asymptomatic but dangerous** to the fetus.
- Vaccination and safe hygiene practices are essential.
- Prompt treatment significantly reduces maternal and fetal risks.

## Syphilis in Pregnancy

### Definition

Syphilis is a chronic, systemic sexually transmitted infection caused by the spirochete *Treponema pallidum*. During pregnancy, the organism can cross the placenta and infect the fetus, leading to congenital syphilis, a preventable but potentially fatal condition.

### Key Information

- Transmission to the fetus can occur at any stage, but risk increases with untreated early-stage disease.
- Congenital syphilis can result in stillbirth, neonatal death, or lifelong disability.
- Early diagnosis and treatment significantly reduce fetal complications.
- Penicillin is the only proven effective treatment during pregnancy.

### Risk Factors

- Inadequate or no prenatal care
- Multiple sexual partners or unprotected sex
- Coinfection with other STIs (e.g., HIV)
- Substance abuse
- Previous untreated syphilis

## Pathophysiology

After entering through skin or mucous membranes, *T. pallidum* spreads via the bloodstream. The organism crosses the placenta, typically after the first trimester, infecting fetal tissues. This leads to widespread inflammation affecting multiple fetal organs, particularly the liver, bones, skin, and nervous system, resulting in developmental damage or fetal demise.

## Signs and Symptoms

### Maternal:

- Often asymptomatic
- Primary stage: painless chancre
- Secondary stage: maculopapular rash (palms and soles), fever, lymphadenopathy
- Latent stage: no visible symptoms

### Fetal/Neonatal:

- Miscarriage or stillbirth
- Preterm birth
- Low birth weight
- Hepatosplenomegaly
- Nasal discharge ("snuffles")
- Skeletal abnormalities and neurological impairment (late manifestations)

## Medical Management

- Universal screening at first prenatal visit
- Repeat screening in the third trimester for high-risk women
- Follow-up serologic testing to confirm treatment success

## Medication

- Benzathine Penicillin G (IM)
- Penicillin desensitization is required for allergic patients

## Nursing Management

- Educate patient on disease transmission and treatment importance
- Monitor for Jarisch-Herxheimer reaction (acute febrile response after treatment)
- Reinforce need for partner treatment
- Provide emotional support and reduce stigma

## Possible Nursing Diagnoses

- Risk for impaired fetal development
- Knowledge deficit related to STI prevention
- Risk for infection transmission

## Urinary Tract Infection (UTI) in Pregnancy

### Definition

A UTI is a bacterial infection of the urinary tract, commonly caused by *Escherichia coli*. Pregnancy predisposes women to UTIs due to anatomical and hormonal changes.

### Key Information

- Asymptomatic bacteriuria is common in pregnancy.
- Untreated UTIs can progress to pyelonephritis, a serious complication.

## NCM 109 2<sup>nd</sup> Semester SY 2025-2026

- Associated with preterm labor, low birth weight, and sepsis.

### Risk Factors

- Hormonal changes (progesterone)
- Urinary stasis from uterine compression
- History of recurrent UTIs
- Diabetes mellitus
- Poor perineal hygiene

### Pathophysiology

Progesterone causes relaxation of smooth muscle in the ureters and bladder, leading to urinary stasis and reflux. The enlarging uterus further compresses the urinary tract. These changes promote bacterial growth and ascending infection from the urethra to the bladder and kidneys.

### Signs and Symptoms

- Dysuria and burning on urination
- Urinary frequency and urgency
- Suprapubic discomfort
- Cloudy or foul-smelling urine
- Fever and flank pain (pyelonephritis)

### Medical Management

- Routine urine screening at prenatal visits
- Antibiotic therapy even if asymptomatic
- Hospitalization and IV antibiotics for pyelonephritis

### Medication

- Nitrofurantoin (avoid near term)
- Cephalosporins
- Amoxicillin-clavulanate

### Nursing Management

- Encourage increased oral fluid intake
- Teach proper perineal hygiene (wipe front to back)
- Monitor urine culture and sensitivity
- Reinforce adherence to antibiotic therapy

### Possible Nursing Diagnoses

- Impaired urinary elimination
- Acute pain
- Risk for preterm labor

## Pneumonia in Pregnancy

### Definition

Pneumonia is an infection of the lung parenchyma that causes inflammation and impaired gas exchange. Pregnancy increases susceptibility due to reduced lung capacity and altered immunity.

### Key Information

- Maternal hypoxia directly affects fetal oxygenation.
- Viral pneumonia (e.g., influenza) is more severe in pregnancy.
- Prompt treatment reduces maternal and fetal morbidity.

### Risk Factors

- Asthma or chronic respiratory disease
- Smoking
- Immunosuppression
- Recent viral infection

### Pathophysiology

Infection leads to alveolar inflammation and fluid accumulation, impairing oxygen diffusion. Reduced maternal oxygenation can result in fetal hypoxia, increasing the risk of fetal distress, growth restriction, or preterm birth.

### Signs and Symptoms

- Fever, chills
- Productive or nonproductive cough
- Dyspnea and tachypnea
- Chest pain
- Decreased oxygen saturation

### Medical Management

- Chest X-ray with abdominal shielding
- Oxygen therapy
- Hospitalization if respiratory compromise is present

### Medication

- Penicillins or cephalosporins
- Azithromycin
- Oseltamivir for influenza-related pneumonia

### Nursing Management

- Monitor respiratory status and oxygen saturation
- Position patient in semi-Fowler's position
- Encourage coughing and deep breathing
- Monitor fetal heart rate patterns

### Possible Nursing Diagnoses

- Impaired gas exchange
- Ineffective airway clearance
- Risk for fetal hypoxia

## Hepatitis B in Pregnancy

### Definition

Hepatitis B is a viral infection of the liver caused by the hepatitis B virus (HBV). Pregnancy poses a significant risk for mother-to-child transmission, particularly during childbirth.

### Key Information

- Neonates have up to a 90% risk of developing chronic infection if untreated.
- Chronic infection can lead to cirrhosis and liver cancer later in life.
- Transmission is preventable with timely neonatal prophylaxis.

### Risk Factors

- Unprotected sexual contact
- Injection drug use
- Exposure to infected blood or body fluids
- Multiple sexual partners

## Pathophysiology

HBV infects hepatocytes, triggering an immune-mediated inflammatory response. Vertical transmission occurs primarily during labor when the infant is exposed to maternal blood and secretions.

### Signs and Symptoms

- Often asymptomatic
- Fatigue
- Jaundice
- Right upper quadrant pain
- Elevated liver enzymes

### Medical Management

- Prenatal screening for HBsAg
- Antiviral therapy in mothers with high viral loads
- Neonatal HBIG and vaccination at birth

### Medication

- Tenofovir for maternal treatment (if indicated)
- HBIG for newborn
- Hepatitis B vaccine within 12 hours of birth

### Nursing Management

- Educate on disease transmission and prevention
- Ensure newborn receives HBIG and vaccine promptly
- Support breastfeeding (safe after immunization)
- Monitor maternal liver function tests

### Possible Nursing Diagnoses

- Risk for infection transmission
- Knowledge deficit related to disease management
- Risk for impaired liver function

## HIV in Pregnancy

### Definition

Human Immunodeficiency Virus (HIV) is a **chronic viral infection** that attacks the immune system—specifically **CD4+ T lymphocytes**—leading to progressive immunosuppression. In pregnancy, HIV poses a significant risk for **vertical (mother-to-child) transmission** during pregnancy, labor, delivery, or breastfeeding.

### Key Information

- Without treatment, mother-to-child transmission rates range from **15–45%**.
- With appropriate **antiretroviral therapy (ART)**, transmission risk can be reduced to **<1%**.
- Transmission can occur **in utero, intrapartum, or postpartum (breastfeeding)**.
- HIV does **not contraindicate pregnancy**, but requires specialized management.
- Viral load is the **most important predictor** of transmission risk.

### Risk Factors

- Unprotected sexual intercourse
- Multiple sexual partners
- Coinfection with other STIs
- Injection drug use
- High maternal viral load
- Lack of prenatal care or late HIV diagnosis

### Pathophysiology

HIV enters the body and targets CD4+ T cells, using them to replicate. Over time, this leads to **progressive immune system destruction**. During pregnancy, the virus can cross the placenta or infect the infant through exposure to maternal blood and genital secretions during delivery. Breast milk can also serve as a transmission route if the mother is viremic.

### Signs and Symptoms

#### Maternal:

- Often asymptomatic, especially early
- Fatigue
- Fever
- Weight loss
- Recurrent infections (e.g., candidiasis, pneumonia)

#### Fetal/Neonatal:

- Intrauterine growth restriction (IUGR)
- Preterm birth
- Low birth weight
- HIV infection (if transmission occurs)

### Medical Management

- **Routine HIV screening** during early pregnancy; repeat in the third trimester for high-risk women
- Regular monitoring of **viral load and CD4 count**
- Planning mode of delivery based on viral load
- Avoidance of invasive obstetric procedures when viral load is detectable

### Medication (if applicable)

- **Combination Antiretroviral Therapy (ART)** for all pregnant women regardless of CD4 count
  - Common regimens include **two NRTIs + one integrase inhibitor**
- **IV Zidovudine (AZT)** during labor if viral load is elevated
- **Neonatal antiretroviral prophylaxis** after birth

### Nursing Management

- Promote strict adherence to ART to maintain viral suppression
- Monitor for medication side effects and toxicity
- Provide education on safe delivery and infant feeding options
- Offer emotional support and reduce stigma
- Coordinate care with infectious disease and obstetric teams
- Ensure newborn receives appropriate prophylaxis and follow-up testing

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**Possible Nursing Diagnoses**

- Risk for infection transmission (maternal-fetal)
- Knowledge deficit related to HIV management in pregnancy
- Anxiety related to chronic illness and pregnancy outcomes
- Ineffective health maintenance related to complex treatment regimen

**“Ang pagpasa mo ay hindi nakadepende sa reviewer na ito. Hindi din pwedeng puro ka dasal pero di ka nagrereview. Gabay lang si Lord. Mag-aral ka! Kaya mo yan =) hehehe”**

**-Sir Doms**

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