NEET SS 2024 Diploma Family Medicine Question Paper 3 with Solutions

Time Allowed :3 Hours	**Maximum Marks :**100	**Total Questions :**10

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 3 hours duration.
2. The question paper consists of 10 questions. The maximum marks are 100.
3. Each Question is of 10 marks.

Q1. A 20-year-old primigravida at 10 weeks comes with persistent vomiting.

a) What are the causes of vomiting in pregnancy? [2]

Solution:

Step 1: Causes of Vomiting in Pregnancy.
Vomiting during pregnancy is common, especially in the first trimester, and can be caused by several factors. The main causes of vomiting in pregnancy include:

(1) Morning Sickness (Nausea and Vomiting of Pregnancy - NVP):
- Occurs in early pregnancy, usually before 12 weeks, and is related to hormonal changes, particularly human chorionic gonadotropin (hCG) and estrogen.

(2) Hyperemesis Gravidarum:
- A more severe form of nausea and vomiting, often leading to dehydration, weight loss, and electrolyte imbalances. This condition usually requires medical treatment.

(3) Gastrointestinal Causes:
- Gastroesophageal reflux disease (GERD), gastritis, or peptic ulcers may exacerbate vomiting during pregnancy.

(4) Infections:
- Gastrointestinal infections (e.g., gastroenteritis) or urinary tract infections (UTIs) can cause nausea and vomiting.

(5) Metabolic Disorders:
- Disorders like diabetic ketoacidosis (in diabetic women) or thyroid disorders may present with vomiting.

Quick Tip

The most common cause of vomiting in early pregnancy is morning sickness, but persistent vomiting could indicate a more severe condition like hyperemesis gravidarum.

Q1. b) What history would you like to know? [2]

Solution:

Step 1: Detailed History Taking.
When assessing a pregnant woman with persistent vomiting, the following historical details are important:

(1) Duration and Onset:
- How long has the vomiting been occurring? Did it start early in pregnancy or more recently?

(2) Frequency and Severity:
- How many times per day does she vomit? Is she able to keep food or liquids down?

(3) Associated Symptoms:
- Does she experience any associated symptoms like abdominal pain, headaches, dizziness, fever, or weight loss? These could suggest a more serious condition.

(4) Past Medical History:
- Any previous history of hyperemesis gravidarum in a prior pregnancy, gastrointestinal disorders, diabetes, or thyroid issues?

(5) Hydration Status:
- Has she been able to maintain adequate fluid intake? Any signs of dehydration such as reduced urine output or dark urine?

(6) Medications and Allergies:
- Is she taking any medications or supplements, such as iron supplements or multivitamins, which could contribute to nausea?

Quick Tip

A thorough history is essential to distinguish between normal pregnancy symptoms (morning sickness) and more serious conditions like hyperemesis gravidarum.

Q1. c) What relevant examination would you like to do? [3]

Solution:

Step 1: General and Focused Physical Examination.
A thorough examination is essential to assess the severity of the condition and identify possible complications. The following examinations should be performed:

(1) General Examination:
- Assess for signs of dehydration (e.g., dry mouth, sunken eyes, decreased skin turgor, and low blood pressure).
- Check for signs of malnutrition (e.g., weight loss, cachexia).
- Vital signs, including pulse, blood pressure, and temperature, should be measured to assess for systemic involvement.

(2) Abdominal Examination:
- A gentle abdominal exam should be done to rule out other causes of vomiting, such as gastritis, peptic ulcers, or an abdominal mass.

(3) Pelvic Examination:
- A pelvic exam may be performed to rule out any gynecological causes of vomiting (e.g., ectopic pregnancy).

(4) Neurological Examination:
- Assess for signs of increased intracranial pressure (e.g., headache, altered consciousness) in case of conditions like preeclampsia or brain tumors.

(5) Hydration Status:
- Check for electrolyte imbalances (e.g., hyponatremia, hypokalemia) that may occur due to vomiting and dehydration.

Quick Tip

Dehydration is a key concern in persistent vomiting during pregnancy, and careful monitoring of hydration and electrolyte status is essential.

Q1. d) How will you manage this lady? [3]

Solution:

Step 1: Initial Assessment and Diagnosis.
After completing the history and examination, the management plan should focus on treating the underlying cause and preventing complications. In this case, the patient is likely experiencing morning sickness or hyperemesis gravidarum.

Step 2: Management of Mild to Moderate Symptoms (Morning Sickness):
- Dietary Modifications: Recommend small, frequent meals and avoiding triggers such as spicy or greasy foods.
- Hydration: Encourage the patient to sip water or oral rehydration solutions to prevent dehydration.

Step 3: Management of Severe Symptoms (Hyperemesis Gravidarum):
If the vomiting is severe and the patient is unable to keep any food or fluids down, the following treatments are considered:

(1) Hospitalization:
- Admit the patient if she shows signs of dehydration or malnutrition. Intravenous fluids (e.g., normal saline with electrolytes) should be administered.

(2) Anti-nausea Medications:
- Pyridoxine (Vitamin B6) is often used first-line, either alone or with doxylamine.
- Ondansetron or metoclopramide can be used for more severe nausea and vomiting.

(3) Electrolyte Correction:
- Correct any electrolyte imbalances (e.g., potassium, magnesium, or sodium).
- Monitor urine output and weight to assess hydration status and nutritional needs.

(4) Nutritional Support:
- In severe cases, parenteral nutrition or enteral feeding may be necessary until the symptoms improve.

Step 4: Follow-up and Long-Term Care.
- Regular follow-up visits to monitor the response to treatment and ensure adequate hydration and nutrition.
- Counsel the patient on the expected course of pregnancy and provide emotional support if necessary.

Quick Tip

Severe vomiting (hyperemesis gravidarum) requires aggressive fluid resuscitation, anti-nausea medication, and careful monitoring for complications like electrolyte imbalances.

Q2. A 30-year-old lady G2P1L1 at 14 weeks, with a history of GDM in the first pregnancy, comes for antenatal care.

a) How will you diagnose GDM? [2]

Solution:

Step 1: Diagnosis of Gestational Diabetes Mellitus (GDM).
Gestational Diabetes Mellitus (GDM) is diagnosed through screening and confirmatory tests during pregnancy. The general approach includes:

(1) Risk Assessment:
- In this case, the patient has a history of GDM in her first pregnancy, which makes her high risk for developing GDM again.

(2) Screening for GDM:
- Oral Glucose Tolerance Test (OGTT): The gold standard for diagnosing GDM. A 75g OGTT is usually performed at 24-28 weeks of gestation, but for high-risk patients, earlier screening may be done.
- Procedure for OGTT: The patient fasts overnight and then consumes a 75g glucose drink. Blood glucose levels are measured at fasting, 1 hour, and 2 hours post-consumption.
- Fasting glucose $\geq$92 mg/dL
- 1-hour glucose $\geq$180 mg/dL
- 2-hour glucose $\geq$153 mg/dL

(3) Alternative Approach:
- One-step and two-step approaches may vary by country or hospital guidelines. The one-step approach uses the 75g OGTT as a diagnostic test, while the two-step approach starts with a 50g glucose challenge test (GCT) at 24-28 weeks and follows up with a confirmatory 100g OGTT if the GCT is positive.

Quick Tip

Early screening is recommended for women with a history of GDM, as they are at higher risk of recurrence in subsequent pregnancies.

Q2. b) What are the complications of GDM? [3]

Solution:

Step 1: Complications of Gestational Diabetes Mellitus (GDM).
GDM can lead to both maternal and fetal complications if not properly managed. The complications include:

(1) Maternal Complications:
- Preeclampsia: Women with GDM are at an increased risk of developing preeclampsia, a condition characterized by high blood pressure and organ damage.
- Infections: Increased glucose levels can predispose women to urinary tract infections (UTIs) and other infections.
- Increased Risk of Type 2 Diabetes: Women who had GDM are at a higher risk of developing

type 2 diabetes later in life.

(2) Fetal Complications:
- Macrosomia: Elevated maternal blood glucose levels lead to excessive fetal growth, increasing the risk of shoulder dystocia and cesarean delivery.
- Neonatal Hypoglycemia: After delivery, the baby may experience low blood sugar due to high insulin levels in the blood at birth.
- Respiratory Distress Syndrome (RDS): High blood sugar can interfere with the production of surfactant in the baby's lungs, leading to RDS.
- Congenital Malformations: Poorly controlled blood sugar in early pregnancy increases the risk of birth defects, particularly in the cardiovascular system and central nervous system.
- Stillbirth: There is an increased risk of stillbirth in women with poorly controlled GDM.

Quick Tip

Proper management of GDM is crucial to minimize risks such as macrosomia, preeclampsia, and long-term diabetes in both the mother and child.

Q2. c) How will you manage GDM? [5]

Solution:

Step 1: Initial Approach to Management.
The management of gestational diabetes involves lifestyle modifications, glucose monitoring, and, if necessary, medication to control blood glucose levels.

Step 2: Lifestyle Modifications.
(1) Dietary Management:
- The patient should be referred to a dietitian to create a balanced, low-glycemic, nutrient-dense diet. This helps maintain stable blood sugar levels.
- Emphasize small, frequent meals to avoid large blood sugar spikes.

(2) Exercise:
- Encourage moderate physical activity, such as walking or swimming, for at least 30 minutes most days of the week. Regular exercise can help regulate blood glucose levels.

(3) Weight Management:
- Instruct the patient to aim for appropriate weight gain during pregnancy (usually 11-20 pounds for women with normal BMI) to reduce the risk of complications.

Step 3: Blood Glucose Monitoring.
- Self-monitoring of blood glucose (SMBG) is essential to track glucose levels. The patient should check fasting blood glucose levels and 1-hour postprandial glucose levels.

Step 4: Medical Management.
(1) Insulin Therapy:
- Insulin is the preferred treatment for women who cannot control blood glucose through diet and exercise alone. It is safe for both mother and baby.
- The starting dose of insulin is usually 0.7-1.0 units/kg/day, adjusted based on the patient's blood glucose levels.
- Insulin is typically administered in the form of long-acting insulin (basal insulin) and short-acting insulin (prandial insulin) to maintain optimal glucose levels.

(2) Oral Hypoglycemic Agents:
- Metformin and Glyburide are oral medications used in some cases. These may be prescribed if the patient is insulin-resistant or prefers oral treatment, although insulin remains the gold standard.

(3) Fetal Monitoring:
- Regular ultrasounds to monitor fetal growth and check for signs of macrosomia.
- Non-stress tests and biophysical profiles can be done to assess fetal well-being, especially in the later stages of pregnancy.

Step 5: Postpartum Care.
- Follow-up glucose testing is recommended 6 weeks postpartum to screen for type 2 diabetes, as women with a history of GDM are at a higher risk.
- Women should be counseled on lifestyle modifications to reduce the risk of future diabetes.

Quick Tip

Insulin is the gold standard for treating GDM when lifestyle changes are insufficient, and close monitoring is required for both maternal and fetal well-being.

Q3. You have conducted an assisted normal delivery using an outlet forceps. There is profound vaginal bleeding post-delivery.

a) What is post-partum haemorrhage? [2]

Solution:

Step 1: Definition of Post-Partum Hemorrhage (PPH).
Post-partum hemorrhage (PPH) refers to excessive vaginal bleeding following childbirth. It is commonly defined as blood loss of more than 500 mL after a vaginal delivery and more than 1000 mL after a cesarean section. The bleeding may be either primary (occurring within 24 hours after delivery) or secondary (occurring after 24 hours but within 6 weeks postpartum).

Step 2: Significance of PPH.
PPH is a leading cause of maternal morbidity and mortality, necessitating prompt recognition

and management to prevent complications such as shock, anemia, and organ failure.

Quick Tip

Prompt identification and management of PPH are crucial to prevent complications like shock and organ failure.

Q3. b) What are the causes of PPH? [3]

Solution:

Step 1: Causes of Post-Partum Hemorrhage (PPH).
The causes of PPH can be broadly classified into four T's:

(1) Tone (Uterine Atony):
- The most common cause of PPH, occurring when the uterus fails to contract adequately after delivery. This leads to continuous bleeding from the placental site. Risk factors include prolonged labor, overdistended uterus (due to multiple pregnancies or large babies), or uterine infections.

(2) Trauma (Birth Canal Trauma):
- Injury to the birth canal, such as tears to the cervix, vagina, or perineum, or uterine rupture, can result in significant bleeding. Use of instruments like forceps during assisted delivery increases the risk of trauma.

(3) Tissue (Retained Placental Tissue):
- Retained placenta or placental fragments in the uterus can prevent complete uterine contraction and cause continued bleeding. This can occur with placenta accreta or if the placenta does not detach properly.

(4) Thrombin (Coagulopathy):
- Coagulation disorders, such as disseminated intravascular coagulation (DIC) or bleeding disorders (e.g., hemophilia), can impair blood clotting and contribute to PPH. Coagulopathy can be triggered by factors such as infection, pre-eclampsia, or amniotic fluid embolism.

Quick Tip

The "four T's" (tone, trauma, tissue, and thrombin) are the key causes of PPH and should be systematically addressed during management.

Q3. c) How will you manage PPH? [5]

Solution:

Step 1: Initial Management of PPH.
The management of PPH is a time-sensitive process aimed at stopping the bleeding, restoring blood volume, and preventing shock. The following steps are essential:

(1) Call for Help:
- Immediately activate the emergency response team and call for senior assistance. Early intervention is crucial.

(2) Assessment and Monitoring:
- Assess the vital signs (heart rate, blood pressure, respiratory rate) and level of consciousness. Monitor oxygen saturation, and initiate IV fluids (preferably crystalloids like Ringer's lactate or normal saline) to manage hypovolemia.

(3) Uterine Massage and Oxytocin Administration:
- Perform fundal massage to stimulate uterine contraction. - Oxytocin (10 IU) should be administered intravenously or intramuscularly to promote uterine contraction and minimize further bleeding.

Step 2: Additional Pharmacologic Management.

(4) Second-Line Uterotonic Agents:
If uterine atony persists after oxytocin, other uterotonics should be considered:
- Methylergonovine (Methergine): 0.2 mg IM every 2-4 hours (contraindicated in hypertension).
- Carboprost (Hemabate): 250 µg IM every 15-90 minutes (contraindicated in asthma).
- Misoprostol: 800 µg orally or rectally, especially in resource-limited settings.

(5) Empty the Bladder:
- A full bladder can prevent effective uterine contraction. Ensure the bladder is empty by catheterizing if necessary.

Step 3: Surgical and Interventional Management.

(6) Manual Removal of Retained Placenta:
- If retained placenta is suspected, manual removal under sterile conditions should be performed.

(7) Repair of Birth Canal Trauma:
- If trauma to the cervix, vagina, or perineum is suspected, suturing of the lacerations or episiotomy should be performed.

(8) Balloon Tamponade (Bakri Balloon):
- If uterine atony persists, a balloon tamponade can be inserted into the uterus to apply pressure and control bleeding.

(9) Surgical Intervention (Hysterectomy):
- If bleeding cannot be controlled with conservative methods, a hysterectomy may be necessary, particularly in the case of uterine rupture or severe atony.

Step 4: Post-Management Care.

- After controlling bleeding, closely monitor the patient for signs of shock or coagulopathy and provide supportive care, including blood transfusions if necessary.

Quick Tip

Immediate action, including uterine massage, oxytocin administration, and addressing the underlying cause, is crucial in the management of PPH.

Q4. A 25-year-old lady comes for postnatal care, and you are asked to advise on contraception for this lady.

a) What are the different contraceptive methods available? [3]

Solution:

Step 1: Contraceptive Methods Overview.
Contraceptive methods are used to prevent pregnancy, and they vary in terms of effectiveness, ease of use, and side effects. The major contraceptive methods available include:

(1) Barrier Methods:
- Condoms (Male and Female): Physical barrier to sperm, also offers protection against sexually transmitted infections (STIs).
- Diaphragms and Cervical Caps: Barrier placed in the cervix to block sperm entry.

(2) Hormonal Methods:
- Oral Contraceptives (Combined Pill or Progestin-only Pill): Pills taken daily to suppress ovulation and thicken cervical mucus.
- Contraceptive Injections: Injectable forms of progestin given every 3 months.
- Contraceptive Implants: Small rods inserted under the skin that release progestin for up to 3 years.
- Contraceptive Patch and Vaginal Ring: Release hormones to prevent ovulation, replaced regularly (weekly for the patch, monthly for the ring).

(3) Intrauterine Devices (IUDs):
- Copper IUD (Non-hormonal): A T-shaped device inserted into the uterus that prevents sperm from fertilizing the egg.
- Hormonal IUD: Releases progestin to thicken cervical mucus and prevent sperm entry.

(4) Sterilization:
- Tubal Ligation (Female Sterilization): A permanent method where the fallopian tubes are blocked or severed.
- Vasectomy (Male Sterilization): A surgical procedure to block the vas deferens.

(5) Natural Methods:
- Rhythm Method, Withdrawal (Coitus Interruptus), and Lactational Amenorrhea: Based on fertility awareness or avoiding ejaculation during intercourse.

Quick Tip

The choice of contraception depends on the woman's health, preferences, and whether she desires a temporary or permanent method.

Q4. b) What are the advantages and disadvantages of them? [3]

Solution:

Step 1: Advantages and Disadvantages of Contraceptive Methods.
Each contraceptive method has its own set of advantages and disadvantages.

(1) Barrier Methods (Condoms, Diaphragms):

- Advantages: - No prescription needed.
- Protection against STIs (condoms).
- Easily reversible.

- Disadvantages: - May decrease sexual pleasure.
- Must be used consistently and correctly.
- Diaphragms and cervical caps may cause irritation or discomfort.

(2) Hormonal Methods (Oral Contraceptives, Injections, Implants, Patch, Vaginal Ring):

- Advantages: - Highly effective when used correctly.
- Can regulate menstrual cycles and reduce menstrual cramps.
- Convenient options like the patch and ring that require less frequent attention.

- Disadvantages: - Requires prescription.
- Potential side effects such as headaches, nausea, or mood changes.
- No protection against STIs.
- May not be suitable for women with certain health conditions (e.g., hypertension or blood clotting disorders).

(3) Intrauterine Devices (IUDs):

- Advantages: - Long-term effectiveness (5-10 years for hormonal and copper IUDs).
- Hormonal IUDs may reduce menstrual bleeding or cramps.
- Low maintenance once inserted.

- Disadvantages: - Insertion can be painful and requires a healthcare provider.
- Possible side effects like irregular bleeding or spotting.
- Small risk of pelvic infection after insertion.

(4) Sterilization:

- Advantages: - Permanent, highly effective.
- No need for ongoing contraception.

- Disadvantages: - Permanent, not easily reversible.
- Surgical risks involved in the procedure.

(5) Natural Methods:

- Advantages: - No cost, no medication involved.
- Can be an option for women who cannot use hormonal contraception.

- Disadvantages: - Less effective, requires careful tracking.
- High risk of failure, especially with irregular cycles.

Quick Tip

Hormonal methods are very effective but may have side effects, while barrier methods are safe but require consistent use.

Q4. c) What is emergency contraception? [4]

Solution:

Step 1: Definition of Emergency Contraception.
Emergency contraception (EC) refers to methods used to prevent pregnancy after unprotected sexual intercourse or contraceptive failure (e.g., condom breakage). It is most effective when used as soon as possible after the incident.

Step 2: Types of Emergency Contraception.

(1) Emergency Contraceptive Pills (ECPs):

- Levonorgestrel (Plan B): A single-dose pill taken within 72 hours of unprotected sex. Most effective when taken within 24 hours.
- Ulipristal Acetate (ella): A prescription-only pill that can be taken up to 120 hours after unprotected sex. It works by delaying or inhibiting ovulation.

(2) Copper IUD:
- The copper IUD can be used as emergency contraception if inserted by a healthcare provider within 5 days of unprotected sex. It is the most effective form of emergency contraception.
- It works by preventing fertilization and implantation of the egg.

Step 3: Mechanism of Action.
Emergency contraception primarily works by:

- Inhibiting or delaying ovulation.
- Interfering with fertilization by altering the cervical mucus.
- Preventing implantation of a fertilized egg in the uterus (in the case of the IUD).

Step 4: Effectiveness and Timing.
- ECPs are most effective if taken within 24 hours of unprotected intercourse but can still be effective if taken up to 72-120 hours.
- The copper IUD is the most effective form of emergency contraception and can be used up to 5 days after unprotected sex.

Step 5: Side Effects and Considerations.
- ECPs may cause nausea, fatigue, headaches, or changes in menstrual bleeding.
- Copper IUD may cause cramping, spotting, or an increased risk of pelvic infection if not inserted properly.

Quick Tip

Emergency contraception is most effective when used as soon as possible after unprotected intercourse and should not be used as a regular form of contraception.

Q5. A 48-year-old lady comes to see you since she had no periods for the last 12 months.

a) What is menopause, early menopause, and premature menopause? [2]

Solution:

Step 1: Definition of Menopause.
Menopause refers to the natural biological process marking the cessation of a woman's menstrual cycles for 12 consecutive months, indicating the end of her reproductive years. It typically occurs around age 50-52.

Step 2: Early Menopause.
Early menopause is defined as menopause occurring between ages 40 and 45. It is considered earlier than usual but still within a recognized age range for menopause. It may occur due to genetic factors, medical conditions, or lifestyle factors.

Step 3: Premature Menopause.
Premature menopause refers to the onset of menopause before the age of 40. This can result from various causes, including autoimmune diseases, chemotherapy, genetic conditions, or surgical removal of ovaries.

Quick Tip

Menopause is defined as the cessation of periods for 12 consecutive months. Early menopause occurs between ages 40-45, and premature menopause occurs before 40 years of age.

Q5. b) What are the clinical features and relevant physical examination to be done in a lady with menopause? [3]

Solution:

Step 1: Clinical Features of Menopause.
The clinical features of menopause are primarily due to the decrease in estrogen levels. Common symptoms include:

(1) Hot Flashes and Night Sweats:
- Sudden feelings of intense warmth, typically over the face, neck, and chest, leading to sweating, especially at night.

(2) Irregular Periods:
- Menstrual cycles become unpredictable in the perimenopausal phase, with varying flow and frequency before periods stop altogether.

(3) Vaginal Dryness and Atrophy:
- Decreased estrogen levels lead to vaginal dryness, which can cause discomfort during sexual intercourse (dyspareunia) and increased susceptibility to infections.

(4) Mood Changes:
- Irritability, anxiety, depression, or mood swings may occur due to hormonal fluctuations.

(5) Sleep Disturbances:
- Difficulty falling or staying asleep, often associated with night sweats or hot flashes.

(6) Decreased Libido:
- Reduced interest in sexual activity due to hormonal changes and vaginal discomfort.

(7) Urinary Symptoms:
- Increased frequency of urination, urgency, or increased risk of urinary tract infections (UTIs).

(8) Osteoporosis:
- Decreased bone mineral density due to reduced estrogen, leading to increased risk of fractures.

Step 2: Physical Examination.

A thorough physical examination should include:

(1) Vital Signs:
- Blood pressure measurement to rule out hypertension, which can become more common during menopause.
- Pulse and temperature to check for signs of underlying conditions.

(2) Abdominal Examination:
- To rule out any gynecological or gastrointestinal issues.

(3) Breast Examination:
- To check for any lumps, tenderness, or signs of breast cancer, which becomes more common as women age.

(4) Pelvic Examination:
- To assess vaginal atrophy, uterine size, and pelvic organ prolapse. It is also essential to screen for abnormal masses or uterine issues.

(5) Bone Health Assessment:
- A DEXA (dual-energy X-ray absorptiometry) scan may be considered to assess bone mineral density and screen for osteoporosis.

Quick Tip

In addition to the common menopausal symptoms, a thorough examination should include breast, pelvic, and bone health assessments.

Q5. c) How will you manage a lady with menopause? [5]

Solution:

Step 1: General Approach to Menopause Management.
The management of menopause focuses on alleviating symptoms, preventing complications such

as osteoporosis and cardiovascular disease, and improving the overall quality of life.

Step 2: Hormonal Replacement Therapy (HRT).

(1) Indications for HRT:
- HRT is the most effective treatment for hot flashes, night sweats, vaginal dryness, and other menopausal symptoms. It is especially beneficial in women under 60 or within 10 years of menopause.

(2) Types of HRT: - Estrogen-only therapy (ET): For women who have had a hysterectomy.
- Combined estrogen and progestin therapy (EPT): For women with an intact uterus to reduce the risk of endometrial cancer.

(3) Administration Routes:
- Oral, transdermal (patches), vaginal (creams, rings), or injectable forms.

(4) Risks of HRT:
- Long-term HRT use may increase the risk of breast cancer, stroke, deep vein thrombosis, and gallbladder disease.

Step 3: Non-Hormonal Treatment Options.

(1) Vaginal Estrogen:
- For localized symptoms of vaginal dryness and atrophy, vaginal estrogen (in the form of creams, tablets, or rings) is effective without systemic side effects.

(2) SSRIs/SNRIs:
- Selective serotonin reuptake inhibitors (SSRIs) like fluoxetine or paroxetine, and serotonin-norepinephrine reuptake inhibitors (SNRIs) like venlafaxine, are effective in managing mood swings, anxiety, and hot flashes, particularly in women who cannot take HRT.

(3) Clonidine and Gabapentin:
- These can be used off-label for the management of hot flashes, especially in women who cannot tolerate HRT.

Step 4: Lifestyle Modifications.

(1) Dietary Changes:
- A balanced diet rich in calcium, vitamin D, and fiber to maintain bone health and prevent weight gain.

(2) Exercise:
- Regular physical activity, including weight-bearing exercises, to improve bone density, cardiovascular health, and overall well-being.

(3) Smoking Cessation and Alcohol Reduction:
- Encourage cessation of smoking and reduction in alcohol intake, as both can increase the risk

of osteoporosis and cardiovascular disease.

Step 5: Bone Health and Cardiovascular Protection.

(1) Osteoporosis Prevention:
- Calcium supplements (1200 mg/day) and vitamin D (800-1000 IU/day) are essential to support bone health.
- Bisphosphonates or denosumab may be prescribed for women at high risk of fractures.

(2) Cardiovascular Risk Management:
- Regular blood pressure monitoring, cholesterol levels, and encouraging a heart-healthy diet rich in omega-3 fatty acids and antioxidants.

Quick Tip

HRT is effective for managing menopausal symptoms but should be used cautiously, especially in women with contraindications or those at risk for cardiovascular disease.

Q6. A mother brings her 5-year-old daughter complaining of nocturnal bedwetting.

a) What is nocturnal enuresis? When is it normal? [2]

Solution:

Step 1: Definition of Nocturnal Enuresis.
Nocturnal enuresis refers to the involuntary passage of urine during sleep, commonly known as bedwetting. It is a common issue in children.

Step 2: When is it Normal?
- Normalcy of nocturnal enuresis varies with age. It is generally considered normal if it persists:
- In children under 5 years of age, as they may still be developing control over their bladder.
- 50% of children at age 5 will still experience bedwetting.
- 90% of children outgrow it by age 7, making it less concerning after that age, unless other factors are involved.

Quick Tip

Nocturnal enuresis is normal in children under 5, but if it persists beyond age 7 or is associated with other signs, further investigation may be needed.

Q6. b) What are the causes of nocturnal enuresis? [3]

Solution:

Step 1: Causes of Nocturnal Enuresis.
The causes of nocturnal enuresis can be classified into primary and secondary causes.

(1) Primary Nocturnal Enuresis:
- Developmental Delay: Children may take longer to develop control over their bladder, which can result in bedwetting beyond the typical age.
- Genetic Factors: Family history of enuresis is common, suggesting a genetic predisposition.
- Deep Sleep: Some children have a deep sleep pattern and may not wake up to the sensation of a full bladder.

(2) Secondary Nocturnal Enuresis:
- Urinary Tract Infection (UTI): Infections can irritate the bladder, leading to bedwetting.
- Constipation: Large stool volumes can put pressure on the bladder, causing involuntary urination.
- Psychological Factors: Stressful events, such as parental separation or school-related anxiety, can trigger bedwetting.
- Diabetes Mellitus: Uncontrolled diabetes can lead to polyuria and bedwetting.
- Sleep Apnea: Children with sleep apnea may wet the bed due to disrupted sleep cycles and inability to wake up to bladder fullness.

Quick Tip

Secondary enuresis in children after a period of dryness warrants further evaluation for possible underlying causes like infection or stress.

Q6. c) How will you manage a child with nocturnal enuresis? [5]

Solution:

Step 1: Initial Approach to Management.
Management of nocturnal enuresis depends on the underlying cause, age, and severity of symptoms. The approach typically involves non-pharmacological interventions and, if necessary, medications.

Step 2: Non-Pharmacological Management.

(1) Establishing a Routine:
- Encourage the child to use the toilet before bed and reduce fluid intake in the evening to minimize the chance of bedwetting.

(2) Bladder Training:
- Gradually increase the time between bathroom visits during the day to help the child gain better control over their bladder.

(3) Nighttime Awakening:
- Some children benefit from being woken up once or twice during the night to use the bathroom, though this may not work for all children.

(4) Enuresis Alarm:
- Bedwetting alarms are a highly effective treatment that wakes the child when they start to urinate, helping to condition them to wake up before wetting the bed.

Step 3: Pharmacological Management.

(1) Desmopressin (DDAVP):
- A synthetic antidiuretic hormone that reduces urine production during the night. It is typically used in cases where other methods have failed.

(2) Imipramine (Tofranil):
- An antidepressant with anticholinergic properties, which is sometimes used to treat enuresis, though it has more side effects and is less commonly used today.

(3) Oxybutynin:
- Used if there is a bladder storage issue or overactive bladder, which may contribute to enuresis.

Step 4: Addressing Underlying Causes.

(1) Treatment of UTI or Constipation:
- If a UTI or constipation is found, appropriate treatments should be initiated.

(2) Psychological Support:
- If the enuresis is secondary to stress or anxiety, appropriate psychological support and counseling may be needed to address the underlying issue.

(3) Diabetes Management:
- If diabetes is diagnosed, proper glycemic control is essential.

Step 5: Long-Term Management and Follow-up.
- Regular follow-up visits should be scheduled to monitor progress, adjust treatment plans, and provide reassurance and support for both the child and family.

Quick Tip

Behavioral techniques, like bladder training and enuresis alarms, are the first line of treatment for nocturnal enuresis and are often effective before considering medications.

Q7. A mother brings her 12-year-old child with complaints of knee pain. She is worried about rheumatic fever.

a) What is rheumatic fever? [2]

Solution:

Step 1: Definition of Rheumatic Fever.
Rheumatic fever is an inflammatory disease that can develop after a group A streptococcal (GAS) throat infection, particularly scarlet fever or streptococcal pharyngitis. It affects multiple systems, including the heart, joints, skin, and central nervous system. Rheumatic fever is more common in children aged 5 to 15 years.

Step 2: Pathophysiology.
The body's immune response to the GAS infection results in cross-reactivity, causing inflammation in various organs, particularly the heart, leading to complications like rheumatic heart disease.

Quick Tip

Rheumatic fever typically occurs 2-4 weeks after an untreated or inadequately treated streptococcal throat infection.

Q7. b) What are the diagnostic criteria for rheumatic fever? [3]

Solution:

Step 1: Introduction to Diagnostic Criteria.
The diagnosis of rheumatic fever is based on the Jones Criteria, which includes major and minor criteria. These criteria help confirm the diagnosis when there is a history of a recent streptococcal infection.

Step 2: Major Criteria (Required for Diagnosis).
The major criteria are indicative of systemic involvement and include:

(1) Carditis: Inflammation of the heart, often affecting the mitral valve, leading to murmurs, heart failure, or pericarditis.
(2) Polyarthritis: Migratory inflammation of large joints (e.g., knees, elbows, wrists). It is typically transient and moves from one joint to another.
(3) Chorea (Sydenham's chorea): A neurological manifestation characterized by involuntary, jerky movements.
(4) Erythema Marginatum: A characteristic, non-itchy, raised, red rash with a well-defined edge, usually found on the trunk and limbs.

(5) Subcutaneous Nodules: Painless, firm nodules that appear over joints or tendons.

Step 3: Minor Criteria (Supportive for Diagnosis).
Minor criteria include evidence of previous streptococcal infection and nonspecific findings:

(1) Fever: Elevated body temperature (above 38°C).
(2) Arthralgia: Joint pain without evidence of inflammation.
(3) Elevated Acute Phase Reactants: Elevated ESR (erythrocyte sedimentation rate) and CRP (C-reactive protein).
(4) Prolonged PR Interval: Seen on electrocardiogram (ECG), indicating heart conduction disturbances.

Step 4: Diagnosis of Rheumatic Fever.
- A diagnosis of rheumatic fever is made if there is evidence of a recent streptococcal throat infection (positive throat culture or rapid antigen test) along with two major criteria or one major and two minor criteria.

Quick Tip

The Jones criteria are crucial for diagnosing rheumatic fever and distinguishing it from other causes of similar symptoms.

Q7. c) How will you manage a child with rheumatic fever? [5]

Solution:

Step 1: Initial Management of Acute Phase.
The management of a child with rheumatic fever focuses on controlling the acute inflammatory response, preventing progression to rheumatic heart disease, and preventing further streptococcal infections. The main approaches include:

(1) Antibiotic Therapy:
- Penicillin: The first-line treatment for eradicating the streptococcal infection and preventing recurrence. A single dose of benzathine penicillin (IM) or oral penicillin can be given.
- Alternatives: For penicillin-allergic patients, erythromycin or azithromycin can be used to eradicate the group A streptococcal infection.

(2) Anti-inflammatory Treatment:
- Aspirin is used to reduce inflammation and treat the pain associated with polyarthritis. It should be given in high doses initially, followed by tapering as symptoms improve.

(3) Corticosteroids:
- Prednisolone may be used in cases of carditis or severe polyarthritis to reduce inflammation

and prevent long-term heart damage.

(4) Symptomatic Treatment:
- Pain management with NSAIDs like ibuprofen to relieve joint pain and swelling associated with polyarthritis.
- Rest is essential during the acute phase to prevent worsening of symptoms and joint damage.

Step 2: Long-Term Management and Prevention of Recurrence.

(1) Secondary Prophylaxis:
- After the initial episode of rheumatic fever, long-term penicillin prophylaxis is recommended to prevent recurrent infections and subsequent episodes of rheumatic fever. This can be done via monthly benzathine penicillin injections or daily oral penicillin.
- Prophylaxis should continue for at least 5 years or until the child reaches 21 years of age, whichever is longer, depending on the severity of heart involvement.

(2) Monitoring for Heart Disease:
- Regular follow-up visits to monitor for signs of rheumatic heart disease. This may include routine echocardiograms to assess valve function, particularly the mitral valve.
- Referral to a cardiologist if there are signs of valve damage or heart failure.

Step 3: Education and Support.
- Provide counseling to the family about the importance of secondary prophylaxis and the prevention of future infections.

Quick Tip

Secondary prophylaxis is crucial in preventing recurrent episodes of rheumatic fever, which can lead to permanent heart damage.

Q8. A mother brings her 5-year-old child of weight 20 kg, with complaints of loose stools since morning.

a) How will you assess dehydration in a child with loose stools and vomiting? [3]

Solution:

Step 1: Importance of Dehydration Assessment.
Dehydration is a common and serious complication of diarrhea and vomiting in children. The degree of dehydration should be assessed early to guide management and prevent complications such as shock.

Step 2: Clinical Signs of Dehydration.
Dehydration is classified based on the severity of symptoms:

(1) Mild Dehydration:
- Thirsty but alert.
- Slight decrease in urine output (normal or slightly decreased).
- Moist mucous membranes (slightly dry).

(2) Moderate Dehydration:
- Thirsty and irritable or lethargic.
- Reduced urine output (not passing as much urine, darker in color).
- Dry mouth and skin, sunken eyes.
- Skin may lose elasticity (skin pinch test may take longer to return).

(3) Severe Dehydration:
- Very lethargic, weak, or unconscious.
- Very reduced or absent urine output (no urine passed for several hours).
- Deeply sunken eyes, very dry skin.
- Sunken fontanel (in infants), cold extremities.
- Rapid, weak pulse, and low blood pressure.

Step 3: Fluid Loss Estimation.
- Dehydration can also be estimated based on the degree of weight loss.
- A mild case may result in ¡5% weight loss, moderate 5-10%, and severe dehydration ¿10% weight loss.

Quick Tip

Early recognition of dehydration severity and prompt intervention is critical in children with diarrhea and vomiting.

Q8. b) How will you classify and manage dehydration according to IMNCI? [7]

Solution:

Step 1: Classification of Dehydration According to IMNCI.
The Integrated Management of Neonatal and Childhood Illness (IMNCI) guidelines classify dehydration into three categories:

(1) No Dehydration (Well Hydrated):
- The child has normal thirst and is able to drink fluids adequately.
- No signs of dehydration such as dry mouth or sunken eyes.
- Normal urine output.

(2) Some Dehydration (Moderate Dehydration):
- The child is moderately thirsty and may show irritability.
- Some dry mouth and skin, sunken eyes.

- Decreased urine output.

(3) Severe Dehydration:
- The child shows signs of severe lethargy, weakness, or unconsciousness.
- Profound sunken eyes, very dry skin, and absent urine output for prolonged periods.
- Shock-like symptoms, including rapid pulse and low blood pressure.

Step 2: Management of Dehydration Based on IMNCI.

(1) Mild Dehydration (No Dehydration):
- Oral Rehydration Solution (ORS): Encourage oral rehydration with ORS to maintain hydration.
- Home management: 50-100 mL of ORS for every diarrhea episode.

(2) Moderate Dehydration (Some Dehydration):
- Oral Rehydration Therapy (ORT): The child should be given ORS 75 mL/kg body weight over 4-6 hours.
- Continue feeding as usual (breastfeeding or normal diet).
- Monitor the child for improvement or worsening of dehydration.
- If vomiting is present, ORS should be given in small sips or by spoon, especially if the child resists drinking large amounts at once.

(3) Severe Dehydration:
- Intravenous (IV) Fluids: Immediate IV rehydration is essential, especially if the child is unable to take fluids orally.
- Start with Ringer's Lactate or Normal Saline: 20 mL/kg body weight in the first hour.
- Gradual rehydration with IV fluids should continue, and the child should be monitored for signs of shock.
- Once the child is stable and able to drink, ORT can be continued.

Step 3: Ongoing Management and Monitoring.
- Once rehydrated, continue to monitor the child for signs of dehydration or fluid imbalance.
- If dehydration is managed at home (mild to moderate cases), follow-up within 24-48 hours to reassess hydration status.

Step 4: Prevention of Further Dehydration.
- Encourage continued oral intake (ORS or breast milk) to prevent further fluid loss.
- Avoid sugary drinks (e.g., soda) and undiluted fruit juices, as they may worsen diarrhea.

Quick Tip

In cases of severe dehydration, immediate IV fluids are critical, while mild to moderate dehydration can be managed with ORS.

Q9. a) What are the types of research studies? [5]

Solution:

Step 1: Introduction to Research Studies.
Research studies are critical for generating new knowledge and answering scientific questions. They are typically categorized based on the study design and objectives. The primary types of research studies are:

Step 2: Types of Research Studies.

(1) Descriptive Studies:
- These studies aim to describe characteristics or behaviors without manipulating the study population. They include:
- Case Reports and Case Series: Detailed description of a single case or a series of similar cases.
- Cross-sectional Studies: Snapshot of a population at a single point in time to assess the prevalence of a condition.

(2) Analytical Studies:
- These studies aim to identify associations or causality between variables. They include:
- Case-Control Studies: Compares individuals with a condition (cases) to those without (controls) to identify risk factors.
- Cohort Studies: Follows a group (cohort) over time to observe outcomes and risk factors. Can be prospective or retrospective.

(3) Experimental Studies:
- These studies involve the manipulation of variables to observe outcomes. They include:
- Randomized Controlled Trials (RCTs): Participants are randomly assigned to treatment or control groups to evaluate the effect of an intervention.
- Field Trials and Clinical Trials: Testing of interventions in real-world settings or clinical environments.

(4) Qualitative Research:
- These studies explore human experiences, perceptions, and social phenomena, typically using methods such as interviews, focus groups, and ethnography.

(5) Systematic Reviews and Meta-Analyses:
- These are types of secondary research where existing studies are systematically reviewed, synthesized, and analyzed to draw conclusions about a particular research question. Meta-analysis involves statistical pooling of data from multiple studies.

Quick Tip

Descriptive studies provide foundational knowledge, while analytical and experimental studies help identify causes and test interventions.

Q9. b) What is sensitivity, specificity, and predictive value? [5]

Solution:

Step 1: Introduction to Diagnostic Test Evaluation.
Sensitivity, specificity, and predictive values are statistical measures used to evaluate the performance of diagnostic tests. These measures help determine the accuracy of a test in identifying true cases (sensitivity) and non-cases (specificity), as well as the test's predictive power.

Step 2: Sensitivity.
- Definition: Sensitivity refers to the ability of a test to correctly identify those with the disease (true positives). It is the proportion of actual positives correctly identified by the test.
- Formula:

$$\text{Sensitivity} = \frac{\text{True Positives}}{\text{True Positives} + \text{False Negatives}}$$

- Interpretation: A test with high sensitivity is good at detecting the disease and will rarely miss true cases (low false negatives). It is crucial for screening tests where it is important not to miss any cases.

Step 3: Specificity.
- Definition: Specificity refers to the ability of a test to correctly identify those without the disease (true negatives). It is the proportion of actual negatives correctly identified by the test.
- Formula:

$$\text{Specificity} = \frac{\text{True Negatives}}{\text{True Negatives} + \text{False Positives}}$$

- Interpretation: A test with high specificity is good at ruling out those without the disease and will rarely result in false positives. It is important for confirmatory tests where false positives must be minimized.

Step 4: Predictive Values.

(1) Positive Predictive Value (PPV):
- Definition: PPV is the probability that a person who tests positive actually has the disease.
- Formula:

$$\text{PPV} = \frac{\text{True Positives}}{\text{True Positives} + \text{False Positives}}$$

- Interpretation: PPV increases with higher disease prevalence and is more useful when considering whether a positive test result should lead to treatment.

(2) Negative Predictive Value (NPV):
- Definition: NPV is the probability that a person who tests negative actually does not have the disease.
- Formula:

$$\text{NPV} = \frac{\text{True Negatives}}{\text{True Negatives} + \text{False Negatives}}$$

- Interpretation: NPV increases with lower disease prevalence and is helpful in ruling out the disease.

Step 5: Relationship Between Sensitivity, Specificity, and Predictive Values.
- Sensitivity and specificity are intrinsic properties of the test and remain constant regardless of disease prevalence.
- Predictive values, however, are influenced by disease prevalence in the population being tested. For example, as the prevalence of a disease increases, PPV increases, and NPV decreases.

Quick Tip

Sensitivity and specificity are used to evaluate the accuracy of a diagnostic test, while predictive values depend on both test accuracy and disease prevalence.

Q10. a) What do you mean by red flags and yellow flags in history taking? [5]

Solution:

Step 1: Introduction to Red Flags and Yellow Flags.
In medical history taking, red flags and yellow flags are terms used to identify specific signs or risk factors that may indicate serious underlying conditions or potential complications. These flags help clinicians prioritize the need for further investigation or referral.

Step 2: Red Flags.
- Red flags are warning signs that suggest serious or potentially life-threatening conditions that require immediate attention. These may indicate the presence of a condition that needs urgent investigation or intervention. Red flags are typically associated with high-risk situations and should prompt further evaluation, tests, or referral.

Examples of red flags include:
- Severe or unexplained weight loss.
- Unrelieved pain despite treatment, or pain that worsens over time.
- History of cancer, especially if the patient presents with new, unexplained symptoms.
- Neurological deficits, such as sudden numbness, weakness, or loss of sensation.
- Severe chest pain or shortness of breath, which could suggest a heart attack or pulmonary embolism.
- Persistent fever without an obvious cause, which could indicate infection or inflammation.
- Change in bowel or urinary habits, especially if accompanied by pain or blood, which could indicate malignancy or infection.

Step 3: Yellow Flags.
- Yellow flags are indicators that suggest the potential for chronicity or disability but are not necessarily indicative of a life-threatening condition. They highlight areas where psychosocial factors may influence the patient's recovery or the course of their illness. Yellow flags often refer to attitudes, beliefs, or behaviors that may prevent recovery or lead to long-term problems.

Examples of yellow flags include:
- Fear-avoidance behavior (e.g., avoiding activity due to fear of pain or injury).
- Negative attitudes towards recovery or healthcare, such as the belief that pain will always be present or that treatment is futile.
- Catastrophizing, where a patient exaggerates the severity of symptoms and focuses excessively on pain.
- Social or work-related stressors, including financial issues, interpersonal conflicts, or job dissatisfaction, which may interfere with recovery.
- Lack of support systems, such as family or community support, which may impede recovery or increase stress.

Quick Tip

Red flags should be prioritized for urgent action, while yellow flags often require addressing psychosocial aspects to prevent long-term issues or disability.

Q10. b) What is safety netting in consultation? [5]

Solution:

Step 1: Definition of Safety Netting.
Safety netting in medical consultations refers to providing patients with clear instructions about what to do if their condition worsens or if new symptoms develop after the consultation. It is a crucial aspect of patient management, ensuring that the patient knows how to seek help if necessary and understands the potential risks of their condition.

Safety netting is part of patient-centered care, ensuring that patients feel supported and informed even after leaving the consultation. It also helps mitigate the risks of missed diagnoses or complications that may arise after the consultation.

Step 2: Key Components of Safety Netting.

(1) Clear Instructions and Guidance:
- Provide the patient with specific actions to take if symptoms change or worsen. For example, advising when to return for a follow-up appointment or seek urgent care if specific symptoms occur.
- Offer clear signs to watch for, such as worsening pain, fever, or changes in mobility.

(2) Follow-up Plan:
- Establish a follow-up plan to ensure that the patient's progress is monitored. This could include booking a follow-up appointment or encouraging the patient to contact the clinic if they feel concerned.

(3) Emergency Contacts:
- Inform the patient about who to contact in case of urgent issues or worsening conditions, such as a primary care physician, specialist, or emergency services.

(4) Written Information:
- Provide written instructions for the patient, so they have a reference in case they forget the advice given. This can include symptoms to monitor and when to seek medical attention.

(5) Clarification and Empowerment:
- Empower the patient by ensuring they understand the importance of the safety netting advice. Ask them to repeat the instructions to ensure comprehension.

Step 3: Importance of Safety Netting.
- Prevention of Harm: It ensures that patients do not suffer unnecessary harm due to delayed diagnosis or worsening of their condition.
- Patient Reassurance: It provides reassurance to patients that they will be supported if their condition changes.
- Documentation: Safety netting should be documented in the patient's medical records as part of the consultation process, ensuring that there is a clear record of the advice given.

Quick Tip

Safety netting empowers patients by providing them with clear instructions on how to respond to worsening symptoms, which can help prevent delays in seeking care.
