

ONMedU, Department of Obstetrics and Gynecology. Practical class №12. "Physiology of pregnancy. Methods of examination of pregnant women. Perinatal care"

MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

International Faculty

Department of obstetrics and gynecology



CONFIRMED by

Vice-rector for scientific and
pedagogical work

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METHODOLOGICAL RECOMMENDATIONS
FOR PRACTICAL CLASS

International Faculty, Course V

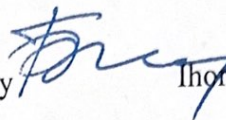
Discipline "Obstetrics and Gynecology"

Practical class №12. "PHYSIOLOGY OF PREGNANCY. METHODS OF EXAMINATION OF PREGNANT WOMEN. PERINATAL CARE"

APPROVED

by a meeting of the Department of Obstetrics and Gynecology
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Practical class №12.

PHYSIOLOGY OF PREGNANCY. METHODS OF EXAMINATION OF PREGNANT WOMEN. PERINATAL CARE

LEARNING OBJECTIVE is to gain basic knowledge about anatomical, physiological and biochemical changes during pregnancy, be familiar with the physiologic adaptations associated with a normal pregnancy, be able to differentiate between certain signs and symptoms that can be common to both disease processes and to physiologic adaptations of pregnancy, obtain knowledge about methods of obstetrical examination, appropriate prenatal counseling and supervision in order to provide successful obstetric outcome.

BASIC CONCEPTS: Fertilization and development of a fertilized egg. Placenta, its structure and function. Critical periods of embryo and fetal development. Influence of harmful factors on the embryo and fetus. Physiological changes in a woman's body during pregnancy. Hygiene and nutrition of a pregnant woman. Methods of examination of pregnant women: diagnosis of early and late pregnancy. Orientation of baby in the uterus. Management of physiological pregnancy. Laboratory diagnosis of HIV infection. Counseling in the context of HIV infection. The concept of counseling and its ethical principles. Counseling skills. Determination of maternity leave date and date of birth.

EQUIPMENT

- Obstetric models and obstetric instruments (pelvimeter, obstetric stethoscope, centimeter tape).
- Professional algorithms, structural-logical schemes, tables, videos.
- Results of laboratory and instrumental researches, situational tasks, patients, medical histories.
- Multimedia equipment (computer, projector, screen), TV.

EDUCATIONAL TIME – 4 h

1. ORGANIZATIONAL STAGE

- Greetings,
- checking attendees,
- defining of educational goals,
- providing of positive motivation.

During pregnancy there are progressive anatomical, physiological and biochemical changes not only confined to the genital organs but also to all systems of the body. This is principally a phenomenon of maternal adaptation to the increasing demands of the growing fetus. Unless well understood, these physiological adaptations of normal pregnancy can be misinterpreted as pathological.

Systematic supervision (examination and advice) of a woman during pregnancy is called antenatal (prenatal) care. The supervision should be regular and periodic in nature according to the need of the individual. Actually, prenatal care is the care in continuum that starts before pregnancy and ends at delivery and the postpartum period. Antenatal care comprises of careful history taking and examinations (general and obstetrical), advice given to the pregnant woman. Deep theoretical and practical knowledge of physiology of pregnancy and methods of obstetrical examination are needed for assessment of mother's health status, appropriate prenatal counseling and ensure successful obstetric outcome.

2. CONTROL OF BASIC KNOWLEDGE (written work, written testing, online testing, face-to-face interview, etc.)

2.1. Requirements for the theoretical readiness of students to perform practical classes.

Knowledge requirements:

- Communication and clinical examination skills.
- Ability to determine the list of required clinical, laboratory and instrumental studies and evaluate their results.
- Ability to make a preliminary and clinical diagnosis of the disease
- Ability to perform medical manipulations
- Ability to determine the tactics of physiological pregnancy, physiological labor and the postpartum period.
- Ability to keep medical records.

List of didactic units:

- Fertilization and development of a fertilized egg.
- Placenta, its structure and function.
- Critical periods of embryo and fetal development.
- Influence of harmful factors on the embryo and fetus.
- Physiological changes in a woman's body during pregnancy.
- Hygiene and nutrition of a pregnant woman.
- Methods of examination of pregnant women: diagnosis of early and late pregnancy. Orientation of baby in the uterus.
- Management of physiological pregnancy.
- Laboratory diagnosis of HIV infection.
- Counseling in the context of HIV infection.
- The concept of counseling and its ethical principles.
- Counseling skills.
- Determination of maternity leave date and date of birth.

2.2. Questions (test tasks, tasks, clinical situations) to test basic knowledge on the topic of the class.

Questions:

- Fundamentals of reproduction: gametogenesis, ovulation, fertilization, implantation.
- Principal events in embryonic and fetal development.
- Development, structure and function of the placenta and fetal membranes.
- Genital tract changes during pregnancy, endocrinology of pregnancy.
- Duration of pregnancy, presumptive, probable and definitive symptoms of pregnancy, chronological appearance of specific signs and symptoms of pregnancy.
- Signs of previous child birth.
- Methods of estimation of gestational age and due date of labor.
- Methods of estimation of fetal weight.
- Obstetrics terminology: lie, presentation, position and attitude of the fetus in the uterus.
- Methods of obstetrical abdominal examination: inspection, palpation, auscultation.

Test tasks

Direction: For each of the multiple-choice questions select the lettered answer that is the one best response in each case.

1. Worldwide, which of the following is the most common problem during pregnancy?

- (A) diabetes
- (B) preeclampsia
- (C) heart disease
- (D) urinary tract infection (UTI)
- (E) iron-deficiency anemia

2. A patient presents with a positive pregnancy test, the exact date of the start of her last normal menses, and the date of her luteinizing hormone (LH) surge from a urine kit. Her expected date of delivery can most correctly be calculated by which of the following?

- (A) adding 254 to the date of the start of the last menstrual period (LMP)
- (B) counting 10 lunar months from the time of ovulation
- (C) counting 280 from the first day of the LMP
- (D) counting 40 weeks from the last day of the LMP
- (E) adding 256 to the date of the elevated urinary LH when detected by home testing

3. A friend mentions to you she just had a positive pregnancy test and wonders if you can tell her when she is likely due. The LMP was June 30. Her expected date of labor is approximately which of the following?

- (A) March 23
- (B) April 7
- (C) March 28
- (D) April 23
- (E) March 7

4. A patient presents to your clinic complaining of nausea and vomiting. She is currently ingesting combined oral contraceptive pills (OCP) and has used them for over a year. When you tell her she has a positive pregnancy test, she reports that her last bleeding on the OCPs was 8 weeks ago. In such a situation, determination of the most accurate estimated date of delivery can then be made by which of the following?

- (A) eliciting when breast tenderness or morning sickness began
- (B) assessing uterine size by physical examination
- (C) counting 280 days from the first positive serum pregnancy test
- (D) asking the patient when she first felt pregnant
- (E) obtaining fetal biometry by ultrasound prior to 20 weeks' gestation

5. Fundal height, part of the obstetric examination, is taken from the top of the symphysis pubis to the top of the fundus. How is it measured?

- (A) by calipers, approximating the week of gestation
- (B) in inches, approximating the lunar month of gestation
- (C) in centimeters and divided by 3.5, approximating the lunar months of gestation
- (D) in centimeters, approximating the weeks of gestation beyond 22 weeks
- (E) by calipers in centimeters, prognosticating the fetal weight

6. Using your knowledge of normal maternal physiology, which of the following would you employ if a patient at 38 weeks became faint while lying supine on your examination table?

- (A) aromatic ammonia spirit (smelling salts)
- (B) turning the patient on her side
- (C) oxygen by face mask
- (D) intravenous (IV) drugs to increase blood pressure
- (E) IV saline solution

7. A 19-year-old primigravida with unsure LMP presents to initiate prenatal care. You attempt to estimate gestational age. The uterine fundus is palpable at the level of the pubic symphysis, and fetal heart tones are audible by electronic Doppler. On the basis of this information, what is the approximate gestational age?

- (A) 8 weeks
- (B) 12 weeks
- (C) 16 weeks
- (D) 20 weeks
- (E) 24 weeks

8. Which of the following nutrients is most likely to be deficient during pregnancy?

- (A) iron
- (B) vitamin D
- (C) vitamin A
- (D) calcium
- (E) folic acid

9. The relation of the fetal parts to one another determines which of the following?

- (A) presentation of the fetus
- (B) lie of the fetus
- (C) attitude of the fetus
- (D) position of the fetus
- (E) intention of the fetus

10. A healthy 30-year-old primigravida presents at 34 weeks' gestation. She reports that she has been experiencing abdominal discomfort that increases after eating, especially when in the recumbent position. A series of tests is performed. She has normal vital signs, an unremarkable examination, a fundal height of 33 cm, and a negative urinalysis. Which one of the following represents abnormal test results?

- (A) alkaline phosphatase double that of the reference range
- (B) hemoglobin of 90 g/L
- (C) serum albumin of 35 g/L
- (D) serum creatinine level of 80 mmol/L
- (E) WBC count of 11, 000/mL

Answer key

1	E
2	C
3	B
4	E
5	D
6	B
7	B

8	A
9	C
10	B

3. FORMATION OF PROFESSIONAL SKILLS (mastering skills, conducting curation, determining the treatment regimen, conducting a laboratory study, etc.).

3.1. Content of tasks (tasks, clinical situations, etc.).

Interactive task:

Students of the group are divided into 3 subgroups of 3-4 people each. They work in the classroom, women's outpatient clinic, reception department of the maternity hospital, labor & delivery ward with pregnant women.

Tasks:

- Subgroup I - to assess general condition of pregnant woman, determine the duration of pregnancy, determine due date of birth and estimated fetal weight.
- Subgroup II - to determine orientation baby in the uterus performing external (Leopold's maneuvers) and internal obstetric exam, to perform auscultation of the fetus.
- Subgroup III – to develop a plan of the management of pregnancy, prescribe rational nutrition to pregnant women.

In 30 minutes the groups exchange tasks with each other. Finally students assess results of their classmates.

Tests:

Direction: For each of the multiple-choice questions select the lettered answer that is the one best response in each case.

1. Cessation of menses is regarded as a presumptive sign of pregnancy in a menstrual-age female. In what percentage of cases does macroscopic vaginal bleeding occur during an otherwise normal pregnancy that does not abort?

- (A) never
- (B) approximately 1 %
- (C) approximately 10%
- (D) approximately 20%
- (E) approximately 50%

2. Probable signs of pregnancy include

- (A) detection of fetal movements by the physician
- (B) enlargement of the abdomen
- (C) an X-ray demonstrating the fetus

- (D) lower abdominal cramping
- (E) nausea in the morning

3. Absolute signs of pregnancy include

- (A) enlargement of the uterus
- (B) changes in the cervix
- (C) positive hormonal pregnancy test
- (D) ballottement of the fetus
- (E) none of the above

4. Changes of the vagina that occur during pregnancy include

- (A) decreased vascularity
- (B) decreased secretions
- (C) hypertrophy of the smooth muscle
- (D) vaginal cells appear similar microscopically to those, in the follicular phase of the cycle
- (E) decrease in the thickness of the vaginal mucosa

5. Changes occur in the cervix during pregnancy. They include

- (A) progressive hypertrophy and enlargement of the entire cervix
- (B) retraction of the squamocolumnar junction into the cervical canal
- (C) generalized erythema
- (D) normal small amounts of bleeding
- (E) shortening and thinning

1.	D
2.	B
3.	E
4.	C
5.	E

Case

A woman is referred from the general practitioner for pregnancy dating. She had a positive pregnancy test 3 days ago after she realized that she had missed a period. In the past she had had regular cycles bleeding for 5 days every 28 days. However, she had been taking the combined oral contraceptive pill (COCP) for the last 6 years and stopped only 10 weeks ago. She had a withdrawal bleed at the end of the last packet, followed by an apparently normal period 5 weeks later. She has had no other irregular

bleeding or any abdominal pain. She has had regular intercourse throughout the time since she stopped her COCP and is pleased now to be pregnant.

Transvaginal ultrasound findings are shown in Fig.



1. How can pregnancies be dated and what is the approximate gestational age for this pregnancy?
2. What further investigations would you like to do to confirm this?
3. Why is correct early pregnancy dating important?

Answer

1. Pregnancy dating methods

- Dating by last menstrual period: in women with certain last menstrual period dates (LMP) and a regular cycle, Naegle's rule may be applied, whereby the estimated delivery date is calculated by (LMP date – 3 months +7 days+1 year). Naegle's rule cannot be applied where the cycle is not regular or there has been a pregnancy or hormonal contraception within the last 3 months.
- Dating by bimanual examination: pregnancy dating by bimanual examination is very rarely performed as it is unnecessarily invasive and inaccurate.
- Dating by crown-rump length: from 6 weeks and 2 days an estimate of gestational age can be made by crown–rump length of the fetus according to published reference values.

Transvaginal markers in early pregnancy:

- 4–5 weeks: appearance of gestation sac (anechoic area asymmetrically located within the endometrium towards the fundus of the uterus),
- 5 weeks: appearance of yolk sac (a small round structure within the gestation sac supporting the fetus until the placenta develops, then disappears by 11 weeks),
- 6 weeks: appearance of a fetal pole with a visible fetal heart pulsation within the gestation sac, separate from the yolk sac,
- 7–8 weeks: appearance of the amniotic sac, which later fuses to the chorionic membrane to become invisible on scan by 12 weeks,
- 8 weeks: appearance of fetal limb buds and fetal movements.

The ultrasound shows an intrauterine gestation sac and a yolk sac, so in this case the pregnancy is approximately 5 weeks' gestation.

2. This should be confirmed by re-scan (after at least 2 weeks) when a fetal pole will be visible and crown-rump length can be measured.

3. The importance of accurate dating is:

- timing of Down's syndrome screening,
- accurate gestational age estimation for cases of delivery at the borderline of viability (e.g. preterm delivery at 22–24 weeks),
- timing of induction of labor for post-term pregnancy.

3.2. Educational materials, recommendations (instructions) for performing tasks

CHRONOLOGICAL APPEARANCE OF SPECIFIC SYMPTOMS AND SIGNS OF PREGNANCY

AT 6–8 WEEKS: Symptoms — Amenorrhea, morning sickness, frequency of micturition, fatigue, breast discomfort. Signs: Breast enlargement, engorged veins visible under the skin; nipples and areola more pigmented. Internal examination reveals — positive Jacquemier's sign, softening of the cervix, bluish discoloration of the cervix and Oslander's sign; positive Hegar's and Palmer's sign. Uterine enlargement varies from hen's egg to medium size orange. Immunological tests will be positive. Sonographic evidence of gestational ring.

AT 16TH WEEK: Symptoms — Except amenorrhea, all the previous symptoms disappear. Signs: Breast changes — pigmentation of primary areola and prominence of Montgomery's tubercles, colostrum. Uterus midway between pubis and umbilicus, Braxton-Hicks contractions, uterine souffle, internal ballotement. Sonographic diagnosis.

AT 20TH WEEK: Symptoms — Amenorrhea, quickening (18th week). Signs: Appearance of secondary areola (20th week), linea nigra (20 weeks), uterus at the level of umbilicus at 24 weeks, Braxton-Hicks contractions, external ballotement (20th week), fetal parts (20 weeks), fetal movements (20 weeks), FHS (20 weeks), internal ballotement (16–28 weeks). Sonographic diagnosis.

SIGNS OF PREVIOUS CHILD BIRTH

The following are the features which are to be considered in arriving at a diagnosis of having a previous birth.

- ✓ Breasts become flabbier; nipples are prominent whoever breast-fed their infant; primary areolar pigmentation still remains and so also the white striae.
- ✓ Abdominal wall is laxer and looser. There may be presence of silvery white striae and linea alba.

- ✓ Uterine wall is less rigid and the contour of the uterus is broad and round, rather than ovoid.
- ✓ Perineum is lax and evidence of old scarring from previous perineal laceration or episiotomy may be found.
- ✓ Introitus is gaping and there is presence of carunculae myrtiformes.
- ✓ Vagina is roomier.
- ✓ Cervix: Nulliparous cervix is conical with a round external os. In parous women, it becomes cylindrical and the external os is a transverse patulous slit and may admit the tip of the finger. However, as a result of operative manipulation even a nulliparous cervix may be torn and resembles a multiparous cervix.

ESTIMATION OF GESTATIONAL AGE AND PREDICTION OF EXPECTED DATE OF DELIVERY

Gestational age is about 280 days calculated from the first day of the last normal menstrual period (LMP). Accurate LMP is the most reliable parameter for estimation of gestational age. But in significant number of cases (20–30%), the patients either fail to remember the LMP or report inaccurately. The matter becomes complicated when the conception occurs during lactation amenorrhea or soon following withdrawal of contraceptive pills (ovulation may be delayed for 4–6 weeks) or in cases with bleeding in early part of pregnancy. The following parameters either singly or in combination are useful in predicting the gestational age with fair degree of accuracy.

PATIENT'S STATEMENT

— Date of fruitful coitus: If the patient can remember the date of the single fruitful coitus with certainty, it is quite reliable to predict the expected date of delivery with accuracy of 50% within 7 days on either side. 266 days are to be added to the date of the single fruitful coitus to calculate the expected date.

— Naegele's formula: Provided the periods are regular, it is very useful and commonly practiced means to calculate the expected date. Its prediction range is about 50% with 7 days on either side of EDD. If the interval of cycles is longer, the extra days are to be added and if the interval is shorter, the lesser days are to be subtracted to get the EDD.

❖ Practical skill
Calculation of the expected date of delivery (EDD) This is done according to Naegele's formula (1812) by adding 9 calendar months and 7 days to the first day of the last normal (28 day cycle) period. Alternatively, one can count back 3 calendar months from the first day of the last period and then add 7 days to get the expected date of delivery; the former method is commonly employed. Example: The patient had her first day of last menstrual period on 1st January. By adding 9 calendar months it comes to 1st October and then add 7 days, i.e. 8th

October, which becomes the expected date of delivery. For IVF pregnancy date of LMP is 14 days prior to date of embryo transfers (266 days).

— Date of quickening: A rough idea about the probable date of delivery can be deduced by adding 20 weeks in primigravidae and 22 weeks in multiparae to the date of quickening.

PREVIOUS RECORDS: The required weeks are to be added to make it 40 weeks.

— Size of the uterus prior to 12 weeks more precisely corresponds with the period of amenorrhea.

— Height of the uterus above the symphysis pubis in relation to the landmarks on the abdominal wall.

— Auscultation of FHR at the earliest by 18–20 weeks using ordinary stethoscope and that using Doppler principle at 10th week. Palpation of fetal parts at the earliest by 20th week.

— Recording of positive pregnancy test using immunological principle at first missed period by earliest.

— Ultrasonographic findings at the earliest are: (a) Gestation sac — at 5 weeks. (b) Measurement of crown rump length (CRL) detected at 7 weeks, approximates 10 mm; at 10 weeks – 34 mm (CRL in cm + 6.5 = weeks of pregnancy). Crown — Rump Length (CRL) is most accurate. (Variation \pm 5 days). Second trimester by BPD, HC, AC and FL measurement. Most accurate when done between 12 and 20 weeks (variation \pm 8 days). Third trimester — Less reliable, variation \pm 16 days.

— Lightening: Following the appearance of the features suggestive of lightening, the labor is likely to commence within 3 weeks.

ESTIMATION OF FETAL WEIGHT

- Height of the uterus above the symphysis pubis in centimeters multiplied by abdomen circumference measured on the level of umbilicus in either case gives the weight of the fetus in grams. Example — Height of the uterus above the symphysis pubis = 34 cm and the abdomen circumference = 95 cm. The weight of the fetus will be $34 \times 95 = 3230$ g. However, the approximate size of the fetus is modified by the amount of liquor amnii and thickness of the abdominal wall.
- Sonography: Fetal weight has been estimated by combining a number of biometric data, e.g. BPD, HC, AC and FL. Tables (Hadlock, Shepard) are currently in use

(computer software). Estimated fetal weight likely to be within 10 percent of actual weight.

METHODS OF OBSTETRICAL EXAMINATION

ABDOMINAL EXAMINATION: A thorough and systemic abdominal examination beyond 28 weeks of pregnancy can reasonably diagnose the lie, presentation, position and the attitude of the fetus. It is not unlikely that the lie and presentation of the fetus might change, specially in association with excess liquor amnii and hence periodic checkup is essential.

❖ Practical skill

Abdominal examination

Preliminaries: Verbal consent for examination is taken. The patient is asked to evacuate the bladder. She is then made to lie in dorsal position with the thighs slightly flexed. Abdomen is fully exposed. The examiner stands on the right side of the patient.

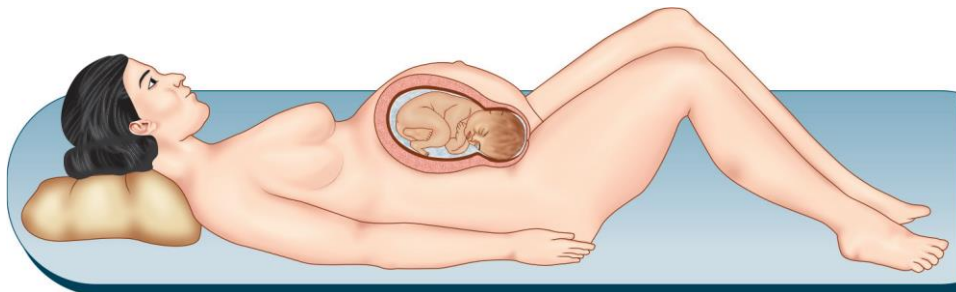


Fig.1: Position of the woman during obstetric examination

Inspection: To note (1) whether the uterine ovoid is longitudinal or transverse or oblique (2) contour of the uterus—fundal notching, convex or flattened anterior wall, cylindrical or spherical shape (3) undue enlargement of the uterus (4) skin condition of abdomen for evidence of ringworm or scabies and (5) any incisional scar mark on the abdomen.

Palpation: Symphysis fundal height (SFH): The uterus is to be centralized if it is deviated. The upper border of the fundus is located by the ulnar border of the left hand and this point is marked. The distance between the upper border of the symphysis pubis upto the marked point is measured by a tape in centimeter. After 24 weeks, the SFH measured in cm corresponds to the number of weeks up to 36 weeks. A variation of ± 2 cm is accepted as normal.



Fig. 2: Symphysis fundal height (SFH)

There are conditions where the height of the uterus may not correspond with the period of amenorrhea. The conditions where the height of the uterus is more than the period of amenorrhea are: (1) mistaken date of the last menstrual period (2) twins (3)

polyhydramnios (4) big baby (5) pelvic tumors— ovarian or fibroid (6) hydatidiform mole and (7) concealed accidental hemorrhage. The condition where the height of the uterus is less than the period of amenorrhea are: (1) mistaken date of the last menstrual period (2) scanty liquor amnii (3) fetal growth retardation and (4) intrauterine fetal death.

❖ **Practical skill**

Obstetric grips (Leopold maneuvers)

Palpation should be conducted with utmost gentleness. Clumsy and purposeless palpation is not only uninformative but may cause undue uterine irritability. During Braxton-Hicks contraction or uterine contraction in labor, palpation should be suspended.

Fundal grip (First Leopold): The palpation is done facing the patient's face. The whole of the fundal area is palpated using both hands laid flat on it to find out which pole of the fetus is lying in the fundus: (a) broad, soft and irregular mass suggestive of breech, or (b) smooth, hard and globular mass suggestive of head. In transverse lie, neither of the fetal poles are palpated in the fundal area.

Lateral or umbilical grip (Second Leopold): The palpation is done facing the patient's face. The hands are to be placed flat on either side of the umbilicus to palpate one after the other, the sides and front of the uterus to find out the position of the back, limbs and the anterior shoulder. The back is suggested by smooth curved and resistant feel. The 'limb side' is comparatively empty and there are small knob like irregular parts. After the identification of the back, it is essential to note its position whether placed anteriorly or towards the flank or placed transversely. Similarly, the disposition of the small parts, whether placed to one side or placed anteriorly occupying both the sides, is to be noted. The position of the anterior shoulder is to be sought for. It forms a well marked prominence in the lower part of the uterus above the head. It may be placed near the midline or well away from the midline.

Pawlik's grip (Third Leopold): The examination is done facing towards the patient's face. The overstretched thumb and four fingers of the right hand are placed over the lower pole of the uterus keeping the ulnar border of the palm on the upper border of the symphysis pubis. When the fingers and the thumb are approximated, the presenting part is grasped distinctly (if not engaged) and also the mobility from side to side is tested. In transverse lie, Pawlik's grip is empty.

Pelvic grip (Fourth Leopold): The examination is done facing the patient's feet. Four fingers of both the hands are placed on either side of the midline in the lower pole of the uterus and parallel to the inguinal ligament. The fingers are pressed downwards and backwards in a manner of approximation of finger tips to palpate the part occupying the lower pole of the uterus (presentation). If it is head,

the characteristics to note are: (1) precise presenting area (2) attitude and (3) engagement.

To ascertain the presenting part, the greater mass of the head (cephalic prominence) is carefully palpated and its relation to the limbs and back is noted. The attitude of the head is inferred by noting the relative position of the sincipital and occipital poles. The engagement is ascertained noting the presence or absence of the sincipital and occipital poles or whether there is convergence or divergence of the finger tips during palpation. This pelvic grip using both the hands is favored as it is most comfortable for the woman and gives most information.

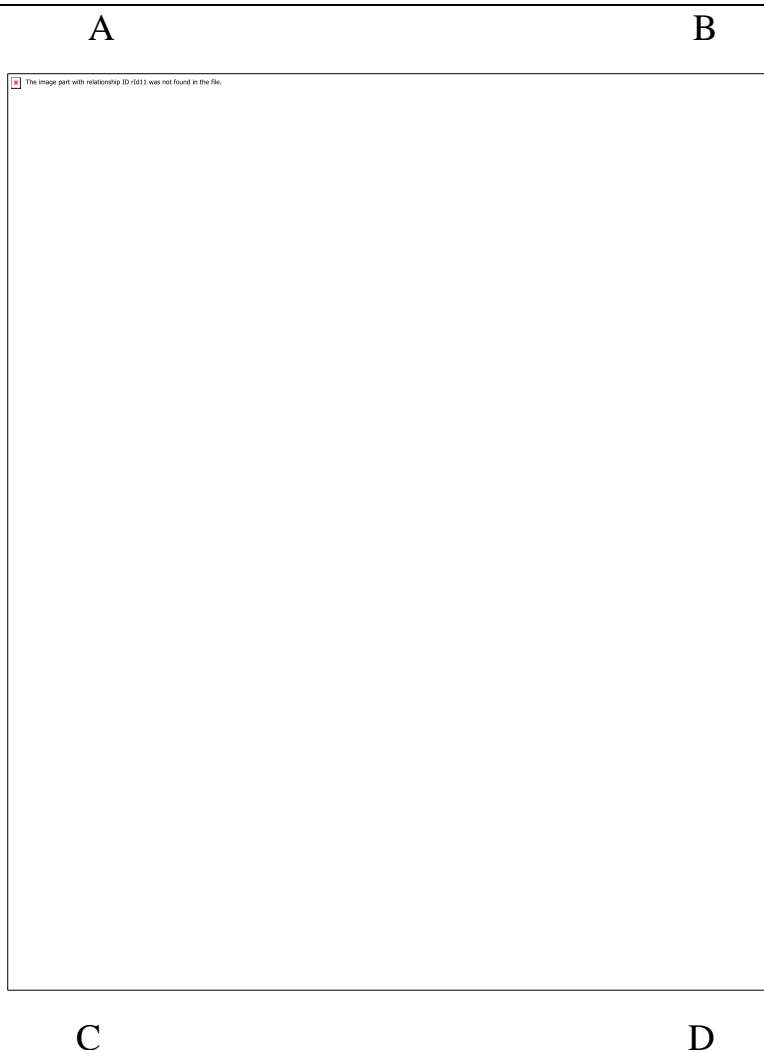


Fig.3: Obstetric grips (Leopold maneuvers): (A) Fundal grip (first Leopold); (B) Lateral grip (second Leopold); (C) Pawlik's grip (third Leopold); (D) Pelvic grip (fourth Leopold)

❖ **Practical skill**

Auscultation

Auscultation of distinct fetal heart sounds (FHS) not only helps in the diagnosis of a live baby but its location of maximum intensity can resolve doubt about the presentation of the fetus. The fetal heart sounds are best audible through the back (left scapular region) in vertex and breech presentation where the convex portion of the back is in contact with the uterine wall. However, in face presentation, the heart sounds are heard through the fetal chest.

As a rule, the maximum intensity of the FHS is below the umbilicus in cephalic presentation and around the umbilicus in breech. In different positions of the vertex, the location of the FHS depends on the position of the back and the degree of descent of the head. In occipitoanterior position, the FHS is located in the middle of the spinoumbilical line of the same side. In occipitolateral position, it is heard more laterally and in occipitoposterior position, well back towards the mother's flank on the same side.

INTERNAL EXAMINATION: The diagnosis of the presentation and position of the fetus may not be accurate by internal examination during pregnancy when the cervix remains closed. However, during labor, accurate information may be obtained by palpation of the sagittal suture and fontanelles through the open cervix. Stress for strict aseptic precautions during vaginal examination needs no emphasis.

ULTRASONOGRAPHY: The diagnosis of the lie, presentation and position may be difficult in the presence of marked obesity, irritable uterus, excessive liquor amnii and deeply engaged head, especially in primigravidae. Ultrasonography can locate the head and the body.

❖ **Practical skill**

Vaginal examination

Time: Vaginal examination is done in the antenatal clinic when the patient attends the clinic for the first time before 12 weeks. It is done (1) to diagnose the pregnancy (2) to corroborate the size of the uterus with the period of amenorrhea and (3) to exclude any pelvic pathology. Internal examination is, however, omitted in cases with previous history of abortion, occasional vaginal bleeding in present pregnancy. Ultrasound examination has replaced routine internal examination. It is more informative and without any known adverse effect.

Procedures: Vaginal examination is done in the antenatal clinic. The patient must empty her bladder

prior to examination and is placed in the dorsal position with the thighs flexed along with the buttocks placed on the footend of the table. Hands are washed with soap and a sterile glove is put on the examining hand (usually right).

Steps:

Inspection: By separating the labia—using the left two fingers (thumb and index), the character of the vaginal discharge, if any, is noted. Presence of cystocele or uterine prolapse or rectocele is to be elicited.

Speculum examination: This should be done prior to bimanual examination especially when the smear for exfoliative cytology or vaginal swab is to be taken. A bivalve speculum is used. The cervix and the vault of the vagina are inspected with the help of good light source placed behind. Cervical smear for exfoliative cytology or a vaginal swab from the upper vagina, in presence of discharge, may be taken.

Bimanual: Two fingers (index and middle) of the right hand are introduced deep into the vagina while separating the labia by left hand. The left hand is now placed suprapubically. Gentle and systematic examination are to be done to note:

(1) **Cervix:** Consistency, direction and any pathology.

(2) **Uterus:** Size, shape, position and consistency. Early pregnancy is the best time to correlate accurately uterine size and duration of gestation.

(3) **Adnexae:** Any mass felt through the fornix. If the introitus is narrow, one finger may be introduced for examination. No attempt should be made to assess the pelvis at this stage.

3.3. Requirements for the results of work.

- To take a medical history (general and specific, such as menstrual, obstetrics) and record information in a standardized proforma (antenatal record book),
- to perform general examination, assess the health status of the mother,
- to determine signs and symptoms of pregnancy, assess their diagnostic value,
- to calculate gestational age and due date of labor,
- to perform abdominal inspection and assess abdominal enlargement, pregnancy marks—linea nigra, striae, surgical scars (midline or suprapubic),
- to perform abdominal palpation and note the height of the fundus above the symphysis and girth of abdomen at the level of umbilicus, calculate estimated fetal weight,
- to identify fetal lie, presentation, position, growth pattern, volume of liquor and also any abnormality, detect whether the presenting part is engaged or not,
- to perform auscultation of fetal heart sounds,
- to assess complaints of pregnant women, explain the origins of minor ailments in pregnancy, give advice how to reduce the problem,
- to assess results of clinical general and obstetrical examinations, lab tests in normal pregnancy,
- to develop a plan of prenatal care in normal pregnancy,
- to counsel the women about signs and symptoms to expect during a normal pregnancy, the importance of regular checkup, give judicious advice regarding diet, drugs and hygiene.

3.4. Control materials for the final stage of the class: tasks, tests, etc.

Tests

1. The softening of the cervical isthmus that occurs early in gestation is called
 - (A) Hegar's sign
 - (B) Chadwick's sign
 - (C) Braxton Hick's contraction
 - (D) Von Fernwald's sign
 - (E) Cullen's sign

2. Which of the following cervical changes may be found more frequently in the pregnant than in the nonpregnant state?
 - (A) atypical glandular hyperplasia
 - (B) dysplasia
 - (C) metaplasia
 - (D) neoplasia
 - (E) vaginal adenosis

3. Which of the following is/are characteristic of the uterine muscle?
 - (A) surrounds blood vessels
 - (B) forms interlacing bundles
 - (C) hypertrophy during gestation
 - (D) is nonstriated
 - (E) all of the above

4. At the 5th lunar month, the uterus in a normal pregnancy is
 - (A) not palpable abdominally
 - (B) palpable just over the symphysis pubis
 - (C) palpable at the level of the umbilicus
 - (D) palpable midway between the umbilicus and the sternum
 - (E) palpable at the level of the xiphoid

5. A soft, blowing sound that is synchronous with the maternal pulse and heard over the uterus is
 - (A) borborygmus
 - (B) uterine soufflé
 - (C) umbilical cord soufflé
 - (D) fetal movement

(E) maternal femoral vessel bruit

6. The hemostatic mechanism most important in combating postpartum hemorrhage is

- (A) increased blood clotting factors in pregnancy
- (B) intramyometrial vascular coagulation due to vasoconstriction
- (C) contraction of interlacing uterine muscle bundles
- (D) markedly decreased blood pressure in the uterine venules
- (E) fibrinolysis inhibition

7. Which of the following situations generally applies to the uterus during pregnancy?

- (A) rotates to the right because of the sacral promontory
- (B) exhibits no rotation
- (C) rotates to the right because of the rectosigmoid
- (D) rotates to the left because of the sacral promontory
- (E) rotates to the left because of the sigmoid colon

8. During pregnancy, the total intrauterine volume at term averages about

- (A) 0,5 L
- (B) 1,0 L
- (C) 2,0 L
- (D) 5,0 L
- (E) 10,0L

9. The uterine muscle mass enlarges during pregnancy because of

- (A) atypical hyperplasia
- (B) anaplasia
- (C) hypertrophy and hyperplasia
- (D) involution
- (E) none of the above; the total muscle mass actually does not change

10. During pregnancy, several ovarian changes can occur which are normal but can be disturbing if not understood. These changes include all of the following EXCEPT

- (A) luteoma of pregnancy
- (B) decidual reaction on the ovarian surface
- (C) corpus luteum of pregnancy

- (D) dermoid cysts
- (E) none of the above

Answer key

1.	D	6.	A
2.	B	7.	C
3.	E	8.	E
4.	C	9.	C
5.	E	10.	B

Case

A 22-year-old primigravida is seen in your office at 28 weeks' gestation for a routine prenatal visit. Her pregnancy has been uneventful to date. She expresses her concern about several moles on her back, which have been enlarging over the past several weeks and for increasing difficulty with constipation. She also relates less energy to complete her job-related responsibilities at work and feels it may be related to the 18-lb weight gain she has experienced since becoming pregnant. She also has noted some gradual shortness of breath over the past 4 to 6 weeks especially when she climbs the three flights of stairs to her office at work. She wears contact lenses and relates that her visual acuity is not as good as before she became pregnant.

Physical examination reveals her height to be 162 cm, her weight to be 68 kg, and her blood pressure to be 90/60 mm Hg. She has several pigmented nevi over her shoulders and back. She has a darkened line on her skin from her xiphoid process to her symphysis. Examination of her heart reveals a 2/6 systolic ejection murmur heard best over the second left intercostal space. Her lungs are clear to auscultation and percussion.

Abdominal examination reveals a 28 cm fundal height with normal bowel sounds, and she has trace pretibial pitting edema. Laboratory values reveal a hemoglobin level of 120 g/L and a platelet count of 125000/mm³. Urinalysis reveals no nitrites or leukocyte esterase, 2+ glucose, and no albuminuria. Fasting glucose level was 4,2 mmol/L.

1. Does this patient have any metabolic or physiologic changes not associated with a normal pregnancy?
2. What is your next step in her evaluation?

Answer

1. Metabolic or physiologic changes not associated with a normal pregnancy: No, all the symptoms, signs, and laboratory values are consistent with the physiologic adaptations of pregnancy.

2. Next step in evaluation: The following are indicated in this patient: (1) Careful dermatological evaluation of her pigmented nevi to rule out the presence of malignant

melanoma. (2) Thyroid function studies should be drawn to evaluate her "lack of energy," and (3) This patient should be advised to report any worsening of her shortness of breath.

4. SUMMING UP

Assessment of the ongoing learning activity at the practical class:

1. Assessment of the theoretical knowledge on the theme:
 - methods: individual survey on the theme, participation of the students in the discussion of problem situations; assessment of performance of tests on the theme;
 - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.
2. Assessment of practical skills on the theme:
 - methods: assessment of the solution of situational tasks (including calculation) on the theme;
 - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.

Assessment of the individual task:

1. Assessment of the quality of the performance of the individual task:
 - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.
2. Assessment of the presentation and defense of an individual task, participation in the assessment of the business plan of the competitors and its critical analysis:
 - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.

The score for one practical class is the arithmetic average of all components and can only have an integer value (5, 4, 3, 2), which is rounded statistically.

Criteria for ongoing assessment at the practical class:

5	The student is fluent in the material, takes an active part in the discussion and solution of situational clinical problems, confidently demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies, expresses his opinion on the topic, demonstrates clinical thinking.
4	The student is well versed in the material, participates in the discussion and solution of situational clinical problems, demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies with some errors, expresses his opinion on the topic, demonstrates clinical thinking.
3	The student isn't well versed in material, insecurely participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies with significant errors.
2	The student isn't versed in material at all, does not participate in the discussion and solution of the situational clinical problem, does not

demonstrate practical skills during the examination of a pregnant and the interpretation of clinical, laboratory and instrumental studies.
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RECOMMENDED LITERATURE

Basic:

1. Gladchuk I.Z. Obstetrics: student`s book / Gladchuk I.Z., Ancheva I.A. . – Vinnitsia: Nova Knyha, 2021. – 288 p.
2. Obstetrics and Gynecology: in 2 volumes. Volume 1. Obstetrics: textbook / V.I. Gryshchenko, M.O. Shcherbina, B.M. Ventskivskyi et al. (2nd edition). – «Medicina», 2018. – 392 p.
3. Hiralal Konar DC Dutta's Textbook of Obstetrics (9th Ed.) / Hiralal Konar (Ed.). – Jp Medical Ltd, 2018. – 700 p.
4. F. Gary Cunningham Williams Obstetrics (26th Edition) / F. Gary Cunningham, Kenneth Leveno, Jodi Dashe, Barbara Hoffman, Catherine Spong, Brian Casey. – McGraw Hill / Medical, 2022. – 1328 p.
5. Jeremy Oats, Suzanne Abraham Llewellyn-Jones Fundamentals of Obstetrics and Gynaecology (10th Ed) / Jeremy Oats, Suzanne Abraham. – Elsevier, 2016. – 384 p.

Additional:

1. The PROMPT-CIPP Editorial Team. (2019). PROMPT-CIPP Course Participant's Handbook: Care of the Critically Ill Pregnant or Postpartum Woman (Critical Care Prompt Practical Obstetric Multi-professional Training). – Cambridge University Press; 1st edition, 2019. – 136 p.
2. L. A. Magee The FIGO Textbook of Pregnancy Hypertension. An evidence-based guide to monitoring, prevention and management. / L. A. Magee, P. Dadelszen, W. Stones, M. Mathai (Eds). – The Global Library of Women's Medicine, 2016. – 456 p.
3. Edwin Chandrharan Handbook of CTG Interpretation: From Patterns to Physiology / Edwin Chandrharan. – Cambridge University Press; 1st edition, 2017. – 256 p.
4. Louise C. Kenny, Jenny E. Myers Obstetrics by Ten Teachers (20th ed) / Louise C. Kenny, Jenny E. Myers. – CRC Press, 2017. – 342 p.
5. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 4. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2017. – 419 p.
6. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 5. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2019. – 403 p.

7. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 6. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2022. – 309 p.
8. Mark Landon Obstetrics: Normal and Problem Pregnancies, 8th Edition / Mark Landon, Henry Galan, Eric Jauniaux, Deborah Driscoll, Vincenzo Berghella, William Grobman, et al. – Elsevier, 2021. – 1280 pp.
9. Mark B. Landon Gabbe's Obstetrics Essentials: Normal & Problem Pregnancies, 1st Edition / Mark B. Landon, Deborah A. Driscoll, Eric R. M. Jauniaux, Henry L. Galan, William A. Grobman, Vincenzo Berghella. – Elsevier, 2019. – 496 pp.
10. Ian M. Symonds, Sabaratnam Arulkumaran Essential Obstetrics and Gynaecology, 6th Edition / Ian M. Symonds, Sabaratnam Arulkumaran. – Elsevier, 2020. – 480 pp.
11. Myra J. Wick Mayo Clinic Guide to a Healthy Pregnancy, 2nd Edition / Myra J. Wick. – Mayo Clinic Press, 2018. – 520 p.

INTERNET SOURCES:

- <https://www.cochrane.org/>
- <https://www.ebcog.org/>
- <https://www.acog.org/>
- <https://www.uptodate.com>
- <https://online.lexi.com/>
- <https://www.ncbi.nlm.nih.gov/>
- <https://pubmed.ncbi.nlm.nih.gov/>
- <https://www.thelancet.com/>
- <https://www.rcog.org.uk/>
- <https://www.npwh.org/>