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SIMULATION TRAINING COURSE IN OBSTETRICS

Study guide

Arkhangelsk
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UDC 618.2

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This study guide is written for medical students, studying Obstetrics and Gynecology. The manual is made in accordance with the requirements of the Russian State Educational Standard. It contains algorithms and techniques for obstetric examination in step-by-step instructions with photographs. The presented trainings of obstetrical manipulations may be provided for both core courses and elective classes.

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СИМУЛЯЦИОННЫЙ КУРС В АКУШЕРСТВЕ

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Данное пособие предназначено для медицинских студентов, изучающих акушерство и гинекологию. Пособие составлено в соответствии с требованиями государственного образовательного стандарта. Материал пособия содержит алгоритмы обследования и технику выполнения ряда акушерских манипуляций в пошаговых инструкциях с фотографиями. Представленные тренинги могут быть использованы на практических занятиях как основного, так и факультативного курса.

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Introduction

Obstetrics and gynecology is a practical subject. In order to be a competent practitioner the trainee needs to acquire a large spectrum of skills. The art of medicine is best learned by the same manner as centuries ago – managing the real patient under the supervision of a senior physician. But this is very risky and is becoming less acceptable to society due to ethical issues these days. In order to keep the idea of "hands-on" learning, a practical and safe approach was found - simulation for the acquisition of task-oriented and behavioral skills.

The purpose of this book is to show step by step the daily procedures in obstetrics. The authors hope that it will be useful to medical students studying obstetrics both in the practical classes of the main and elective courses and wish you easy and pleasant study!

We will start with the basic theory of obstetrics and the first two practical sessions will focus on maternal and fetal labor-related anatomy, introduction to obstetric phantoms and obstetric terms. Then we continue with the examination of the pregnant woman admitted to the maternity ward, and practical exercises on the management of unexpected or precipitous birth.

This textbook is a practical addition to the theoretical module in the discipline «Obstetrics and Gynecology». All sections of the manual are presented with plans for practical exercises, detailed methodological recommendations, brief self-review questions with answers and examples of tasks for practical classes with checklists.

MODULE 1. MATERNAL AND FETAL ANATOMY RELATED TO A SUCCESSFUL LABOR

Introduction. How to make prognosis for the normal labor?

The labor is the process that finishes pregnancy. From the mechanical point of view it is process of cervical opening and a further descent of the rather massive fetal body through narrow birth canal. From this you can define three components that are essentially important for labor to progress smoothly, usually they are evaluated as a rule of "three Ps": **passage, passenger, and powers**.

Passage	the size of pelvis the shape of pelvis cervical opening
Passenger	the size of fetus (mainly of the presenting part), that depends on: fetal lie fetal presentation fetal position fetal attitude
Powers	adequacy of labor contractions effectiveness of maternal pushing efforts

This chapter will discuss first "p" – passage – maternal bony pelvis and soft-tissue birth canal features that are essential to be examined for an adequacy for the successful labor process. Subsequent chapters will continue with main fetal parameters (passenger) and labor forces (powers).

Practical class 1. Maternal Labor-Related Anatomy

When you will finish the class you will be able to

1. make prognosis for the normal labor
2. name pelvic planes and their clinical significance
3. discuss soft-tissue birth canal components
4. find uterine segments
5. estimate ripening, effacement and dilatation (opening) of the cervix
6. explain fetal head extension in late second stage and why it happens
7. define anatomically contracted pelvis
8. name the limitations of pelvic evaluation methods

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Meaning
Contractile agents	*Утеротоники*	
Preterm labor	*Преждевременные роды*	
False labor	*Ложные схватки*	
Fetal membranes	*Плодовые оболочки*	
Multiparity	*Повторнородящая*	
Nulliparity	*Нерожавшая*	
Mucous plug	*Слизистая пробка*	
Trial of labor	*Пробные роды*	
Labor mechanism	*Механизм родов*	
Shape of the pelvis	*Форма таза*	
Lower uterine segment	*Нижний сегмент матки*	

Upper uterine segment	*Верхний сегмент матки*	
Contractile ring	*Контракционное кольцо*	
Uterine quiescence		
Ripening of the cervix	*Созревание шейки матки*	
Effacement of the cervix	*Сглаживание шейки*	
Dilatation of the cervix	*Открытие шейки*	
Pelvic diaphragm	*Тазовое дно*	
Pushing effort	*Потуга*	
Fetal head extension	*Разгибание головки плода*	
Pelvic organ prolapse	*Опущение тазовых органов*	
Fetopelvic disproportion	*Клиническое несоответствие*	
Contracted pelvis	*Узкий таз*	
Dystocia	*Нарушение сократительной деятельности*	
Obstetrical conjugate	*Акушерская конъюгата*	
Diagonal conjugate	*Диагональная конъюгата*	
Midpelvic contraction	*Сужение узкой части таза*	
Outpelvic contraction	*Сужение выхода таза*	
Pelvis adequate for labor	*Таз нормальных размеров*	

You should be able to recall the meaning of the following terms. You should also be able to use the terms when consulting with other health professionals.

Birth Canal

The birth canal consists of the bony true pelvis and soft-tissue birth canal: the lower uterine segment, the cervix, the vagina, the vulva, and the pelvic floor musculature.

☛ The Bony Pelvis

The bony pelvis consists of the two ***innominate*** or hip bones, the ***sacrum***, and the ***coccyx*** (Figure 1.1).

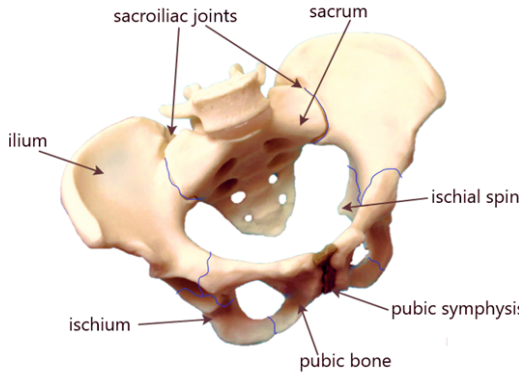


Figure 1.1. Bony pelvis

The innominate bones consist of the ***ilium***, the ***ischium***, and the ***pubic bone***. Anteriorly, the pubic bones are conjoined by the ***pubic symphysis***. Posteriorly, the ilium bones are conjoined to the sacrum by means of the ***sacroiliac joints***. The sacrum is connected to the coccyx by means of the ***sacrococcygeal joint***.

The boundary between the false and the obstetrically more important - ***true pelvis*** is formed by the plane of the (true) ***pelvic inlet***.

(!)The true pelvis has different dimensions at different levels ***(planes)***. The ***pelvic planes*** are imaginary flat surfaces passing across parts of the true pelvis, important planes are shown in Figure 1.2.

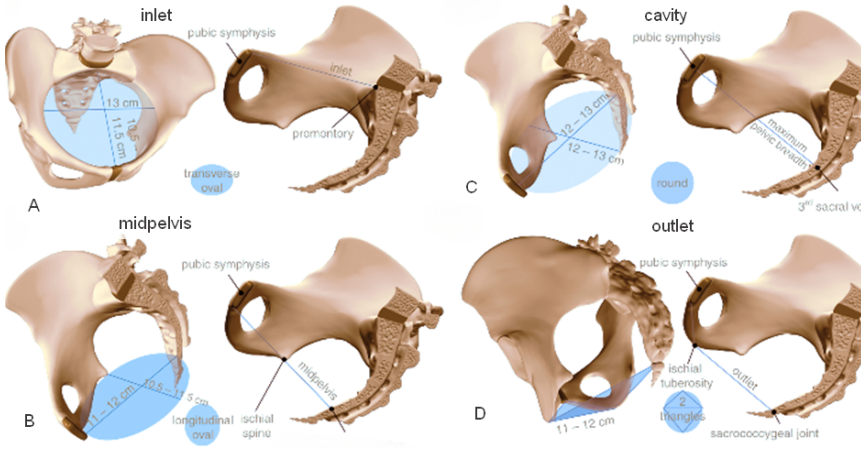


Figure 1.2. The bony pelvic planes. A. Pelvic inlet B. Plane of maximum pelvic breadth (cavity) C. Midpelvis (the narrow plane) D. Plane of outlet. By blue color the plane is shown. Notice the change in plane shape from level to level that is shown in small picture near to the bony pelvis.

There are usually four planes to be named (Figure 1.2 and *Table 1.1*).

- 1st is ***pelvic inlet***
- 2nd – ***plane of maximum pelvic breadth (cavity)***
- 3rd plane is the ***midpelvis (the narrow plane)***, with the ischial spines as reference points, has the smallest diameter.
- 4th plane is ***plane of outlet*** and actually presented by pelvic floor muscles, but also has bone dimensions and points

Table 1.1

Anatomical points and sizes in normal gynecoid shape bony pelvis

Plane	Bone points**:	Bone dimensions (cm)***:	Plane shape
Pelvic inlet	F: upper edge of pubic symphysis L: innominate line B: promontory	AP: 11 Oblique 12 Tr: 13 (max)	
Pelvic cavity	F: middle of pubic symphysis B: middle of sacrum	AP: 12.5 Tr: 12.5	

Midpelvis	F: lower edge of pubic symphysis L: ischium spines (interspinal diameter) B: sacro-coccygial joint	AP: 11.5 Tr: 10.5(min)	
Pelvic outlet*	F: lower edge of pubic symphysis L: ischium tuberosities B: top of coccyx	AP: 11.5 Tr: 11.5-13.5	

(!)Notice the change from largest transverse diameter size in inlet into smaller in midcavity

*Pelvic outlet bone sizes are not of an importance in the process of labor. At this level labor mechanism is mainly limited by **muscle floor**.

** F - front, B - back, L - lateral

***AP - anterior-posterior, Tr - transverse

Differences between pelvic plane sizes are making fetal descent process rather complex (additional flexions and rotations are needed) and is named labor mechanism.

There are four ***shapes of the pelvis*** distinguished: gynecoid (as normal), anthropoid (with prevalent anterior-posterior diameters), platypelloid (with prevalent transverse diameters) and android pelvis (narrow in midcavity) (Fig. 1.3).

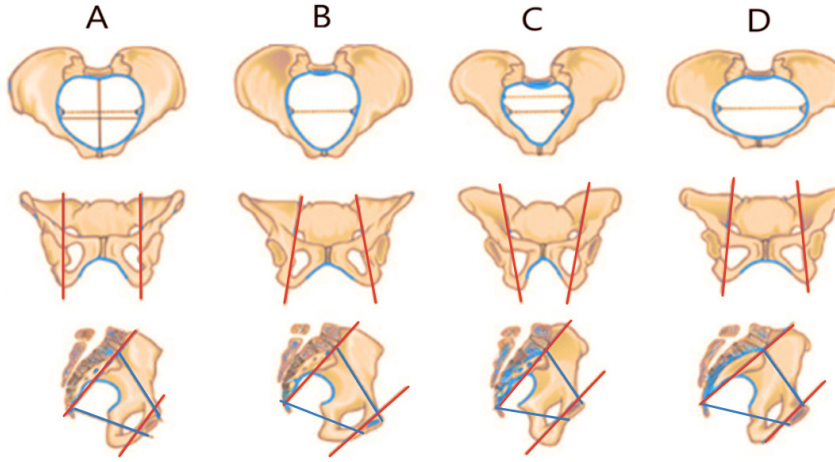


Figure 1.3. Four shapes of bony pelvis
(A – gynecoid, B – anthropoid, C – android, D – plathypeloid)

Every pelvic shape is characterized by *some specificities of the labor mechanism*, being *potentially able to allow the descent of the fetus*, which need its own adaptations by presentation and movements.

Normal labor mechanism is realized in gynecoid pelvis by average size term fetus.

☛ The Soft-Tissue Birth Canal

The soft-tissue birth canal is made of the *lower uterine segment*, *uterine cervix*, *vagina*, *vulva*, and *pelvic floor musculature* (Figure 1.4). During the final phase of the expulsion the birth canal is elongated due to the diastasis of the pelvic floor muscles.

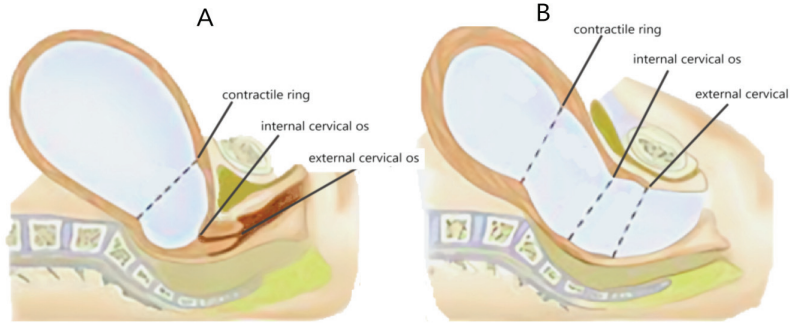


Figure 1.4. Soft-tissue birth canal.
A. in pregnancy period B. during the second stage labor

In the upper part of the birth canal is pear shaped uterus that consists of two (or three) major but unequal parts. The upper, larger portion is the ***body*** or ***corpus***, whereas the lower smaller ***cervix*** projects into the vagina.

The isthmus is the union site of these two. It is of special obstetrical significance because it forms the ***lower uterine segment*** during pregnancy, while corpus is forming ***upper uterine segment***. The border between them, that can be palpated during uterine contraction in active labor is named a ***contractile ring***.

Uterine cervix is cylindrical and in unlaboring woman has small apertures at each end - the ***internal os*** and **external os**. The ***endocervical canal*** runs through the cervix and connects these ora. The cervix is divided into upper and lower portions by the vagina's attachment to its

outer surface. The upper portion — the *portio supravaginalis* —begins at the internal os, which corresponds to the level of the *vesicouterine peritoneum*. The lower cervical portion protrudes into the vagina as the *portio vaginalis*.

The bulk of the uterine body, but not the cervix, is muscle. Cervix is mostly presented by a connective tissue.

During pregnancy, the uterus is transformed into a thin-walled muscular organ of sufficient capacity to accommodate the fetus, placenta, and amnionic fluid – among others this happens because of *uterine hypertrophy and myometrial unresponsiveness to contractile agents* – period of a ***uterine quiescence***.

At the same time *cervix is well closed* and performing *sphincter function* for saving fetal membranes from any contact to vaginal secrets and mechanical damage.

The maintenance of *cervical vaginal portion length, closed endocervical channel and cervical elastic consistence* are essential for pregnancy to continue to term. *Preterm cervical dilation, structural insufficiency*, or both may forecast *abortion* or a *preterm labor*.

Following uterine quiescence, a *transitional phase (**preliminary phase**)* begins during which *myometrial unresponsiveness is suspended* and the *cervix undergoes **ripening, effacement,*** and loss of structural cohesion. This process usually lasts about two to four weeks and characterized by irregular contractions which are less painful, short, reversable and they don't progress by noticeable cervical changes. This condition is termed *false labor (see practical class 4)*.

Labor is characterized by forceful and painful uterine contractions that effect cervical dilation and cause the fetus to descend through the birth canal.

During ***active labor***, the functional uterine divisions become increasingly evident (Figure 1.5). By abdominal palpation, even before membrane rupture, the two segments can sometimes be differentiated. The ***upper segment*** is *firm during contractions*, whereas the ***lower segment*** is *softer, distended*, and more passive.

This mechanism is imperative because if the entire myometrium, including the lower uterine segment and cervix, were to contract simultaneously and with equal intensity, the net expulsive force would markedly decline.

Thus, the *upper segment* ***contracts, retracts,*** *and* ***expels*** the fetus. In response to these contractions, the *softened lower uterine segment* ***distends,*** and *cervix* ***dilates*** and thereby forms a greatly expanded, thinned-out tube through which the fetus can pass.

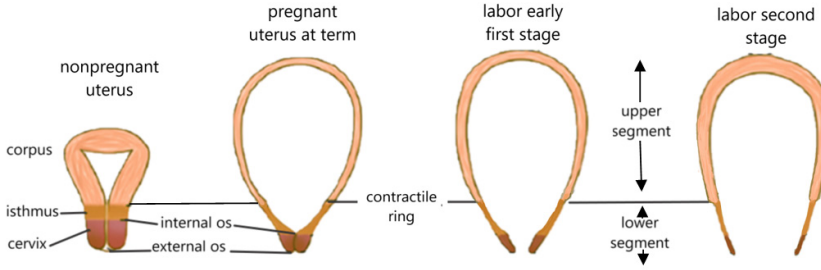


Figure 1.5. Uterine anatomoical and functional segments in nonpregnant, term pregnant and labor stages. Notice that contractile ring (upper border of the isthmus) is subdividing uterus into upper and lower segments in labor period

Thus, two *main uterine segments play different roles during pregnancy and labor periods*. In pregnancy period uterine corpus mostly stay relaxed and distended while cervix save its prepregnancy anatomy keeping length and closed endocervical channel.

At the time of *preparatory to labor period these roles are changed and during* ***active labor*** *they reach their maximum* turning to active and regular uterine contractions (upper segment) and *cervical effacement and dilatation* (lower segment).

☛ What is ripening, effacement and dilatation (opening) of the cervix?

A process called **cervical ripening** happens in process of preparation for labor and meaning that cervix *softens and becomes more distensible*. This process happens due to physiological prelabor connective tissue remodeling *(! not muscles)* that decreases collagen and proteoglycan con-

centrations and increases water content or can be accomplished artificially by the use of *dilators and medications*.

As the *result of contraction forces (!)*, two fundamental changes — effacement and dilation — occur in the *previously ripened cervix*.

Cervical effacement is *shortening of the cervical canal* from a length of approximately 3 cm to a mere circular orifice with almost paper-thin edges. The mechanism of this process is the reposition of the *smooth muscle* cells that are *pulled upward* into the lower uterine segment by uterine contraction. This primarily changes and opens internal cervical os while the external os remains temporarily unchanged. With the progress of the effacement (faster in *multiparous women*) ***cervical dilatation*** starts. For an average-sized fetal head to pass through the cervix, it must *completely or fully dilate* to a diameter of approximately 10 cm (Figure 1.6).

Figure 1.6. Cervical effacement and opening in labor on phantoms.
A. cervix is 0% effaced (>3cm) and not dilated. B. cervix is <50% effaced (2cm) and not dilated. C. cervix is 80% effaced (1cm) and 2 cm dilated. D. cervix is fully effaced and 2 cm dilated. E. cervix is fully effaced and 6-7cm dilated.

So, effacement means that the *cervix shortens and gets thinner*. Dilatation means that the cervix *opens*. Both these processes happen due to uterine contractions and may start earlier than labor onset. *In the absence of regular uterine contractions* effacement and dilatation *are not symp-*

toms of the true labor. Effacement causes expulsion of the *mucous plug* as the cervical canal is shortened.

During labor process cervical effacement and dilatation (opening) are checked regulary through internal examination you will find in the next section.

☛ Pelvic Floor

The birth canal is supported and functionally closed by the pelvic floor. The pelvic floor is also known as the ***pelvic diaphragm***. It spans the pelvic outlet and lies deep to the ***urogenital*** and ***anal triangles*** (see Fig. 1.7).

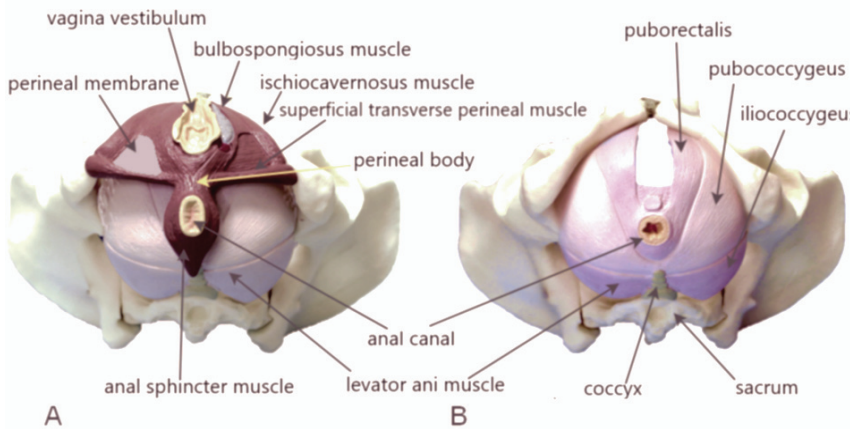


Figure 1.7. Pelvic diaphragm muscles. A. superficial pelvic floor muscles B. Deep pelvic floor muscles.

This broad muscular floor of a *funnel-shaped structure* provides substantial support to the pelvic viscera and is composed of the ***levator ani muscles*** and the *fibromuscular connective tissue* that covers its upper and lower surfaces. There are two 'holes' that have significance:

Urogenital hiatus – an anteriorly situated gap, which allows passage of the urethra and the vagina in females.

Rectal hiatus – a centrally positioned gap, which allows passage of the anal canal.

Between the urogenital hiatus and the anal canal lies a fibrous node known as the ***perineal body***, which joins the pelvic floor to the perineum.

The biomechanical properties of these structures and of the vaginal wall change markedly during parturition. In late second stage of labor, when fetal head passes through pelvic outlet *levator ani muscle* is participating in a ***pushing effort***, moving **up** in a quite *controversial direction to the fetal descend*. Under uterine contraction pressure, increased by maternal pushing effort, fetal head is *over distending* more anterior and *superficial urogenital diaphragm* (*mm. bulbocavernosus, mm. ischiocavernosus, mm. superficial transverse perineal and urogenital fascia*), fixes above pubic symphysis, rotate around this point and thus delivers. This labor moment is named ***fetal head extension***.

This process has a great potential to damage all mentioned above structures or *their innervation*. To minimize the risk of perineal tears different methods are still in the process of a scientific approvement. Most common are – vertical position during labor, stopping pushing at the moment of the fetal head crowning – you will find in the chapter with labor management.

Evidence suggests that most dangerous is levator ani trauma that may predispose women to later **pelvic organ prolapse** with possible urinary incontinence, faecal incontinence, genitourinary prolapse, chronic pelvic pain and sexual dysfunction.

☛ Features of the pelvis that affect labor

The size and the shape of the pelvis make it adequate for labor.

Fetopelvic disproportion arises from diminished pelvic capacity (*passway*) or from large fetal size, or abnormal structure, presentation, or position (*passenger*). Commonly, both "Ps" are present.

The pelvic inlet, midpelvis, or pelvic outlet may be contracted solely or in combination. Any contraction of the pelvic diameters that diminishes pelvic capacity is named ***contracted pelvis*** and can create ***dystocia***.

Before labor, the *biparietal diameter* in a *term fetus* averages from 9.5 to 9.8 cm. Thus, it might prove difficult or even impossible for some fetuses to pass through a pelvic inlet that has an *anteroposterior diameter <10 cm*.

The anteroposterior diameter of the inlet is also called the ***obstetrical conjugate***. It is commonly approximated by manually measuring the ***diagonal conjugate***, which is approximately 1.5 cm greater (Figure 1.8). To measure the *diagonal conjugate*, a hand with the palm oriented later-

ally extends its index finger to the promontory. Inlet contraction usually is defined as a diagonal conjugate <11.5 cm.

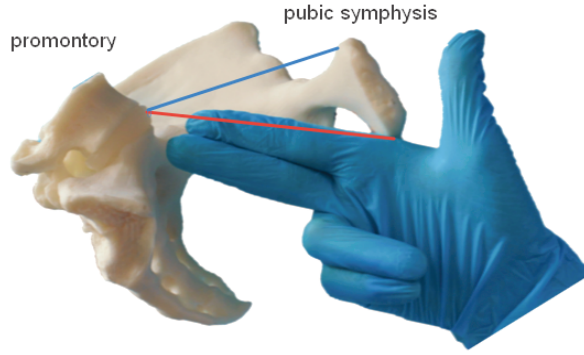


Figure 1.8. Estimation of diagonal conjugate (red line), true conjugate is shown blue.

Midpelvic contraction is suspected whenever the ***interspinous diameter*** is <10 cm. When it measures <8 cm, the midpelvis is contracted. Although *no precise manual method permits measurement of midpelvic dimensions*, but it was noted that the relationship between the intertuberous and interspinous diameters of the ischium is sufficiently constant and that narrowing of the interspinous diameter can be anticipated when the ***intertuberous diameter*** is 8 cm or less (Figure 1.9). The same parameter can be used to identify *outpelvic contraction*.

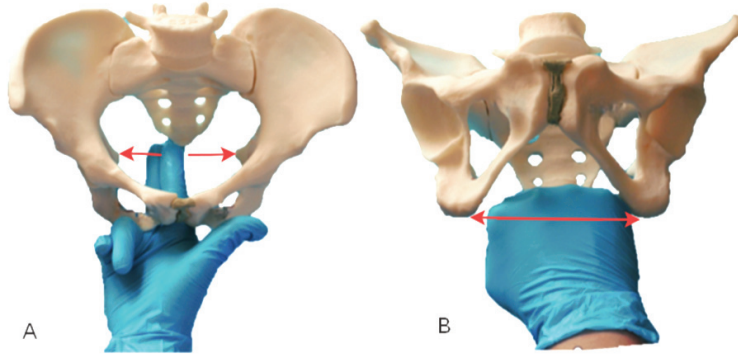


Figure 1.9. Estimation of interspinal (A) and intertuberous (B) diameters.

An accurate objective measurement of the bony pelvis can be done with MRI, but it is expensive, time consuming, not always available, and most importantly, has not been shown to consistently predict women at risk of *fetopelvic disproportion*. Current evaluation of pelvic capacity typically uses only digital interrogation of the bony pelvis. *The most commonly used practice to determine if the woman's pelvis is adequate for delivery of the baby is a* ***trial of labor*** *(WHO, 2018).*

Contracted pelvic sizes do not guarantee fetopelvic disproportion. Diminutive woman is likely to have a small pelvis, but she is also likely to have a small fetus.

Review questions

1. List three critical factors involved in the labor process.

a. _____
b. _____
c. _____

2. Match the definition with the correct term

Pelvic inlet	AP: 11.5cm Tr: 10.5cm
Pelvic cavity	AP: 11.5cm Tr: 11.5-13.5cm
Midpelvis	AP: 12.5 cm Tr: 12.5 cm
Pelvic outlet	AP: 11cm Tr: 13 cm

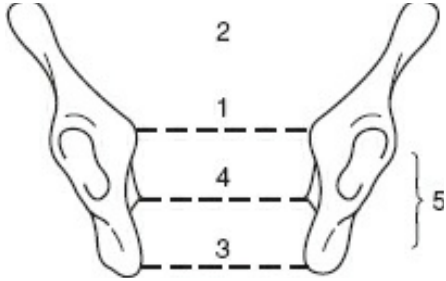
3. List the four main types of pelvises.

a. _____
b. _____
c. _____
d. _____

4. The pelvis best suited for labor and birth is the _____ pelvis.

5. The pelvis that has narrow dimensions and is likely to result in labor stopping or a forceps delivery is the _____ pelvis.

6. Match the areas of the pelvis with the correct numbers in the picture below



a. Inlet____
b. False pelvis____
c. True pelvis____
d. Outlet____
e. Plane of least dimensions____

7. The true pelvis is made up of four key planes called:

a. _____
b. _____
c. _____
d._____

8. The planes of the true pelvis are critical because:

_____
_____
_____

9. Name two ways in which the female pelvis is evaluated for adequacy.

a. _____
b. _____

10. Inlet contraction is suspected whenever the _____diameter is less than ___ cm

REVIEW ANSWER KEY

1. a. Passage b. Passenger c. Power
2. 1d 2c 3a 4b
3. a. Gynecoid b. Android c. Platypelloid d. Anthropoid
4. Gynecoid
5. Contracted
6. 1a 2b 3d 4e 5c
7. a. Least dimensions b. Greatest dimensions (Cavity) c. Pelvic inlet
8. The fetus must pass through these areas, some of which are narrow.
9. a. Pelvic examination b. Trial of a labor (patient's parturition history)
10. Anterior-posterior; 10cm

Practical part

During the practical class you will get a card with ten anatomical structures that you need to show in phantoms and five terms that you need to describe in writing. You will also get a card with patient's examination data to asses her pelvis for adequacy to the labor and birth process.

Example of the card:

Please show on the presented phantoms the following structures:

True Pelvis	
Innominate Bones	
Sacrum	
Coccyx	
Pubic Symphysis	
Sacroiliac Joints	
Sacrococcygeal Joint	
Pelvic Inlet	
Plane Of Maximum Pelvic Breadth (Cavity)	
Midpelvis	

Explain meanings of the following terms:

Dilatation Of The Cervix	
Pelvic Diaphragm	

Pushing Effort	
Fetal Head Extension	
Pelvic Organ Prolapse	

Clinical case: *Mrs S., aged 35. G4P2 is presented at 39 weeks of gestation. Height 158 cm, body weight 69 kg. During an obstetric examination, her symphysiofundal height is 38 cm, the diagonal conjugate is 12.0 cm, and the intertubercular diameter is 9 cm. On ultrasound, the biparietal size of the fetus is 9.5 cm. She had one successful vaginal birth with a female fetus weighing 2.5 kg and one protracted delivery with birth trauma with a male fetus weighing 3.8 kg. Give an interpretation of the maternal pelvis for the adequacy of the birth process.*

The full list of anatomical structures and theoretical terms

Anatomical structures	Obstetric terms
True Pelvis	Rule Of "Three Ps": Passage
Innominate Bones	Rule Of "Three Ps": Passenger
Sacrum	Rule Of "Three Ps": Powers
Coccyx	Labor Mechanism
Pubic Symphysis	Shape Of The Pelvis
Sacroiliac Joints	Lower Uterine Segment
Sacrococcygeal Joint	Upper Uterine Segment
Pelvic Inlet	Contractile Ring
Plane Of Maximum Pelvic Breadth (Cavity)	Uterine Quiescence
Midpelvis	Ripening Of The Cervix
Plane Of Outlet	Effacement Of The Cervix
Internal Cervical Os	Dilatation Of The Cervix
External Cervical Os	Pelvic Diaphragm
Endocervical Channel	Pushing Effort
Urogenital And Anal Triangles	Fetal Head Extension
Levator Ani Muscles	Pelvic Organ Prolapse
Urogenital Hiatus	Fetopelvic Disproportion
Rectal Hiatus	Contracted Pelvis

Perineal Body	Dystocia
Mm. Bulbocavernosus	Obstetrical Conjugate
Mm. Ischiocavernosus	Diagonal Conjugate
Mm. Superficial Transverse Perineal	Midpelvic Contraction
Biparietal Diameter	Outpelvic Contraction
Interspinous Diameter	Trial Of Labor
Intertuberous Diameter	Pelvis Adequate For Labor

The check list example

Date		Student's name		
Labor-related maternal anatomy			Task number	

N.	Tasks	Ratings		
		3	**4**	**5**
1	Anatomical structures shown correct	6-7	8	9-10
2	Theoretical terms defined correct	3	4	5
3	Clinical case for pelvis adequacy	*Partially correct*	*Incompletely correct*	*All correct*

Practical class 2. The Passenger: Fetus

When you will finish the class, you will be able to

1. estimate the fetal weight
2. find and describe main fetal head denominators
3. determine fetal presentation type by palpation
4. determine and describe fetal lie, presentation, attitude, and position
5. define the normal position of the fetus and fetal malposition

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Meaning
Early labor	*Начавшиеся роды*	
Estimated fetal weight	*Предполагаемый вес плода*	
Mode of delivery	*Метод родов*	
Labor induction	*Индукция родов*	
Birthweight	*Вес при рождении*	
Extremely low birthweight (ELBW)	*Экстремально низкая масса тела*	
Very low birthweight (VLBW)	*Очень низкая масса тела*	
Low birthweight (LBW)	*Маловесный*	
Normal birthweight (NBW)	*Нормальный вес при рождении*	
Macrosomic or High birthweight (HBW)	*Крупный плод*	
Giant or Very high birthweight (VHBW)	*Гигантский плод*	
Prematurity	*Недоношенность*	
Intrauterine growth retardation (IUGR)	*Задержка роста плода*	
Chronic fetal hypoxia	*Хроническая гипоксия плода*	
Prolonged labor	*Затяжные роды*	
Shoulder dystocia	*Дистоция плечиков*	

Precipitous birth	*Быстрые (стремительные роды)*	
Symphisiofundal height	*Высота стояния дна матки*	
Maternal abdominal circumference	*Окружность живота*	
Cord prolapse	*Выпадение пуповины*	
External cephalic version	*Наружный поворот на головку*	
Compound presentation	*Смешанное предлежание*	
Denominator`		
Fetal skull sutures	*Швы на головке плода*	
Fetal skull fontanels	*Роднички*	
Molding	*Конфигурация*	
Sinciput	*Лоб*	
Vertex	*Темя*	
Occiput	*Затылок*	
Mentum	*Подбородок*	
Anterior fontanel or Bregma	*Передний (большой) родничок*	
Posterior fontanel	*Задний (малый) родничок*	
Occiput presentation	*Затылочное предлежание (вставление)*	
Vertex presentation	*Теменное предлежание*	
Bregmatic presentation	*Переднеголовное предлежание*	
Brow presentation	*Лобное предлежание*	
Face presentation	*Лицевое предлежание*	
Fetal lie	*Положение плода*	
Presentation	*Предлежание плода*	
Attitude	*Членорасположение плода*	
Position	*Вид и позиция плода*	
Placenta previa	*Предлежание плаценты*	
Polyhydramnios	*Многоводие*	

Funic presentation	*Предлежание пуповины*	
Leopold maneuvers	*Приемы Леопольда*	
Frank breech presentation	*Чисто ягодичное предлежание*	
Complete breech presentation	*Смешанное ягодичное предлежание*	
Footling breech presentation	*Ножное предлежание*	

You should be able to recall the meaning of the following terms. You should also be able to use the terms when consulting with other health professionals

☛ **Effect of the fetal weight on the outcome of labor**

Fetus during the labor process is an object (***passenger***) that needs to pass through the pelvic cavity (***passway***), thus *fetal sizes* within the birth canal is critical to labor progress and to the delivery route. It should be determined *in early labor*, and *sonography* can be implemented for unclear cases.

Fetal size is the clearest characteristic for the successful normal labor prediction and usually is evaluated by *estimated fetal weight*. During routine appointments, fetal weight can influence on the decision making regarding the *mode of delivery* and the timing of *labor induction*.

Infants can be classified by *birthweight:*

- Extremely low birthweight (ELBW) <1000 g
- Very low birthweight (VLBW) <1500 g
- Low birthweight (LBW) <2500 g
- Normal birthweight (NBW) 2500 g to 4000 g
- Macrosomic or High birthweight (HBW) 4000 g to 4500 g
- Giant or Very high birthweight (VHBW) >4500 (5000) g

Note! Low birth weight usually indicates prematurity and must be differentiated from ***intrauterine growth retardation (IUGR)****, which occurs in cases of* ***chronic fetal hypoxia.***

Accurate estimates are essential, since abnormal *fetal growth* may be associated with perinatal and maternal risk. Delivery of a *macrosomic fetus* is associated with *prolonged labor* and various *delivery traumas*, including *shoulder dystocia*, *brachial plexus injuries* and intrapartum hypoxia, as well as increased maternal risks such as *birth canal injuries* and *postpartum hemorrhage*.

At the other extreme, it is important to identify a *low birth weight* and *growth-restricted fetus* to determine the control interval and the time of delivery in order to minimize perinatal risks, including *malpresentation*, *precipitous birth*, intrauterine fetal death and neonatal morbidity.

The two most commonly used methods to estimate fetal weight are *ultrasound* and *clinical examination*.

In countries where ultrasound is not available, ***estimated fetal weight*** (**EFW**) is obtained by measuring ***symphisiofundal height*** (SFH) and **maternal abdominal circumference** (AC) (see practical class 4). Measurements are taken using a flexible tape calibrated in cm. Maternal *abdominal circumference* is measured at the level of the umbilicus.

Insler and Bernstein's or **Jordania** *(in Russia)* **formula:**
EFW(g) = SFH (cm) ×AC (cm)
*Example: SFH=35, AC=99; EFW=35*99=3465g*
Johnson's method:
EFW (g) = (SFH– n) × 155; n=12 if vertex is above ischial spine or 11 if vertex is below ischial spine
*Example: SFH=35, head is not engaged; EFW= (35-12)*155=3565g*

Currently, ultrasound is preferred because of its ease of use, objectivity and precision. The most commonly used formula is ***Hadlock's formula***, which includes *fetal head circumference*, *abdominal circumference*, and *femur length*.

Fetal anatomy peculiarities allow accommodation to the pelvis during labor

The head is the *largest and the heaviest part* of the fetus and compared to the size of the maternal birth canal, is a fairly large object for passage. Fetal head is composed of both *fixed and flexible parts*. Becoming famil-

iar with the parts of the fetal skull is essential because the identification of *certain landmarks* will assist you when performing vaginal examination to determine the mother's labor progress.

The five skull bones (the *two frontal bones, the two parietal bones, and the one occipital bone*) of the fetus are *not joined together* yet but separated other by ***sutures*** and ***fontanels*** (Figure 2.1). This permits the shape of the head to change somewhat as the fetus passes through the narrow, rigid pelvis.

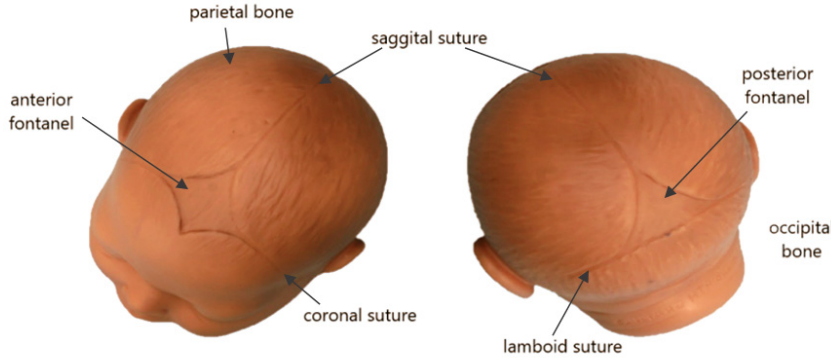


Figure 2.1. Phantom of fetal scull with sutures and fontanels

The fetal skull bones under the force of uterine contractions on the fetal head can be overlapped: this is called **molding**. Molding allows the skull to adapt to the birth canal (Figure 2.2) and it *can be felt during a vaginal examination*.

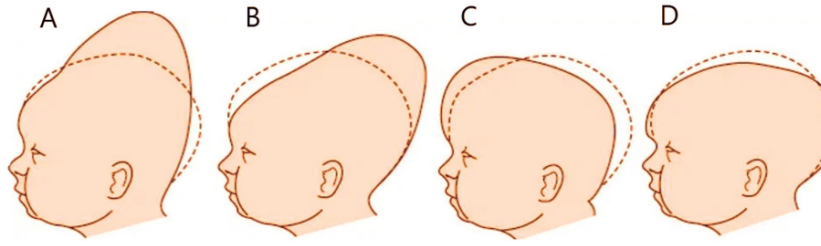


Figure 2.2. Molding of the fetal head in different cephalic presentations. A – vertex presentation, B – occiput presentation, C – brow presentation, D – face presentation.

The general areas of the fetal head are described by four important landmarks (Fig. 2.3):

1. **Sinciput**—brow area
2. **Vertex**—area between the anterior and posterior fontanels
3. **Occiput**—area beneath the posterior fontanels where the occipital bone is located
4. **Mentum**—fetal chin

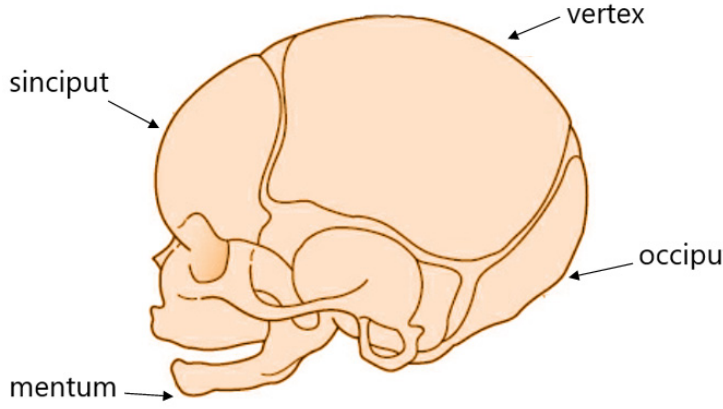


Figure 2.3. Bony landmarks used in describing areas of the fetal head.

Two more landmarks formed by the sutures that are *useful in identifying the position of the fetal head in the pelvis*.

Anterior fontanel (Fig. 2.1) — is *diamond-shaped* and measures 2x3 cm. This is sometimes referred to as the **bregma**. This fontanel can be palpated when the head is *extended or moderately flexed* (Table 2.1). It remains open approximately 18 months after birth to allow for brain growth.

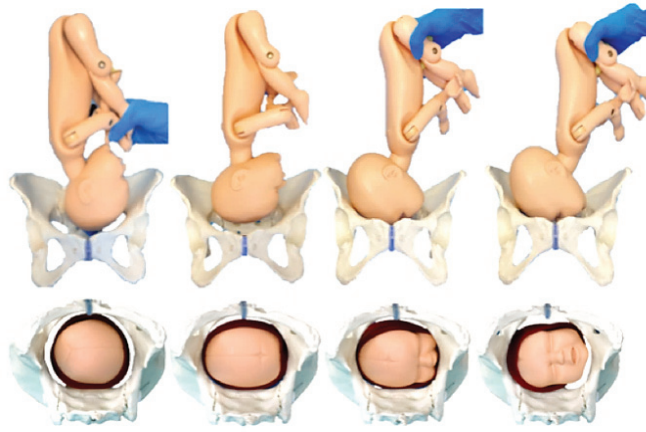
Posterior fontanel (Fig. 2.1) — is smaller and *triangular*. When the head is ***well flexed*** (Table 2.1), this fontanel can be felt. The posterior fontanel closes approximately 12 weeks after birth.

By the palpation of all mentioned landmarks, you can understand the degree of the fetal head flexion and type of its cephalic presentation.

The most important skull dimensions are shown in Table 2.1. Notice that in *flexed types of presentation fetal head sizes are less*.

Table 2.1

The most important skull dimensions in different types of cephalic presentation

Types of presentation	Occiput (vertex) presentation	Bregmatic presentation	Brow (frontal) presentation	Face presentation
Photo of the phantom				
Attitude	Complete flexion	Moderate flexion	Extension	Full extension
AP diameter (cm)	9.5-10	12	13-13.5	9.5

Effect of the fetal positioning on the outcome of labor

From the table 2.1 you see that fetal presentation and position within the birth canal *affects its size* and is critical to the normal process of fetal descend.

To classify the *important relationships* we use terms of ***fetal lie, presentation, attitude,*** *and* ***position***. *Normal lie, presentation and attitude are presenting fetus in his smallest sizes to the pelvic inlet and so giving the best chances to pass through birth canal.*

1. **Lie** is the relationship of the *long axis of the fetus* to that of the mother. In more than 99 percent of labors at term, the fetal lie is *longitudinal* (Figure 2.4).

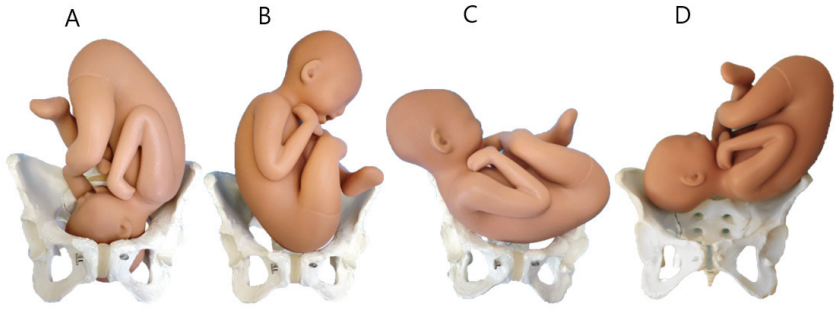


Figure 2.4. Fetal lie. A – cephalic and B – breech are both longitudinal fetal lie, C – transverse lie (both massive parts above the ilium spines), D – oblique lie (one massive part above and one below the ilium spines).

Transverse lie is often associated with the following:

1. Grand multiparity (having five or more pregnancies)
2. A small (contracted) pelvis
3. Placenta previa
4. Polyhydramnios
5. Fetal prematurity
6. Uterine anomalies

Most women at 37 weeks' gestation with a transverse lie convert to a longitudinal lie, but the risk of morbidity from ***cord prolapse*** and ***uterine rupture*** is great. Therefore, *vaginal delivery is not possible with a transverse lie*. ***External cephalic version*** may be attempted; if it fails, a cesarean delivery is planned.

2. **Presentation** is that part of the fetus entering the pelvic inlet first. The term "*compound presentation*" is used when there is more than one fetal part presenting at the pelvic inlet. If the umbilical cord is present at the inlet, it is known as a *funic presentation*.

By *abdominal palpation* (*Leopold maneuvers* – see practical class 4) cephalic or breech presentation may be diagnosed. During labor pro-

cess the presented part is qualified more definitely by vaginal examination (see practical class 4). In case of cephalic presentation into ***occiput, vertex, brow*** *or* ***face*** and in case of breech into ***frank, complete breech*** *or* ***footling*** (Figure 2.5).

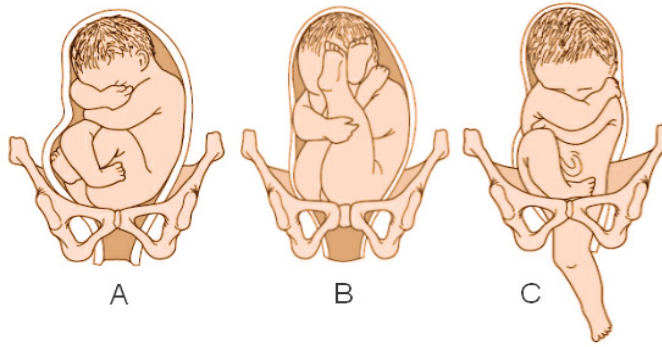


Figure 2.5. Breech presentations. A– complete breech, B – frank, C – footling presentation.

3. **Attitude** is the relationship of the fetal parts (e.g., chest, chin, arms) to each other. Attitude refers to the relationship of the fetal parts to each other. Normally, the attitude is one of ***flexion*** *or* ***extension*** in relation to the fetal spine. Adequate flexion creates the smallest cephalic diameter to facilitate delivery Figure 2.6.

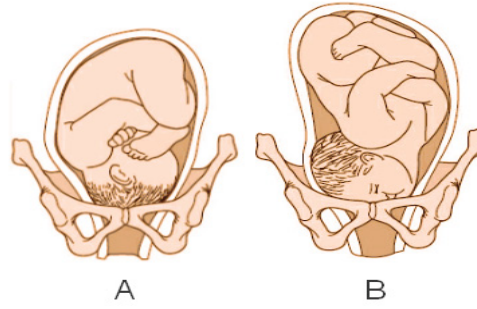


Figure 2.6. Fetal attitude. A – completely flexed (the chin near the chest, arms and legs arefolded in the front of the body, back is curved) – presents the smallest possible fetal measurments, B – partially extended (here head is bent back), fetus is presented with larger diameter, and this may make the delivery traumatic.

4. **Position** is the relationship of the presenting part to four sides (left-right and anterior-posterior) of the mother's pelvis. In describing fetal position, certain landmarks on the fetus, called *denominators,* are used.

In *vertex* presentations, the *occiput* is the denominator (Fig. 2.7 A, B, C).

In *face* presentations, the *mentum* (chin) is the denominator (Fig. 2.7 D).

In *breech* presentations, the *sacrum* is the denominator (Fig. 2.7 E, F)

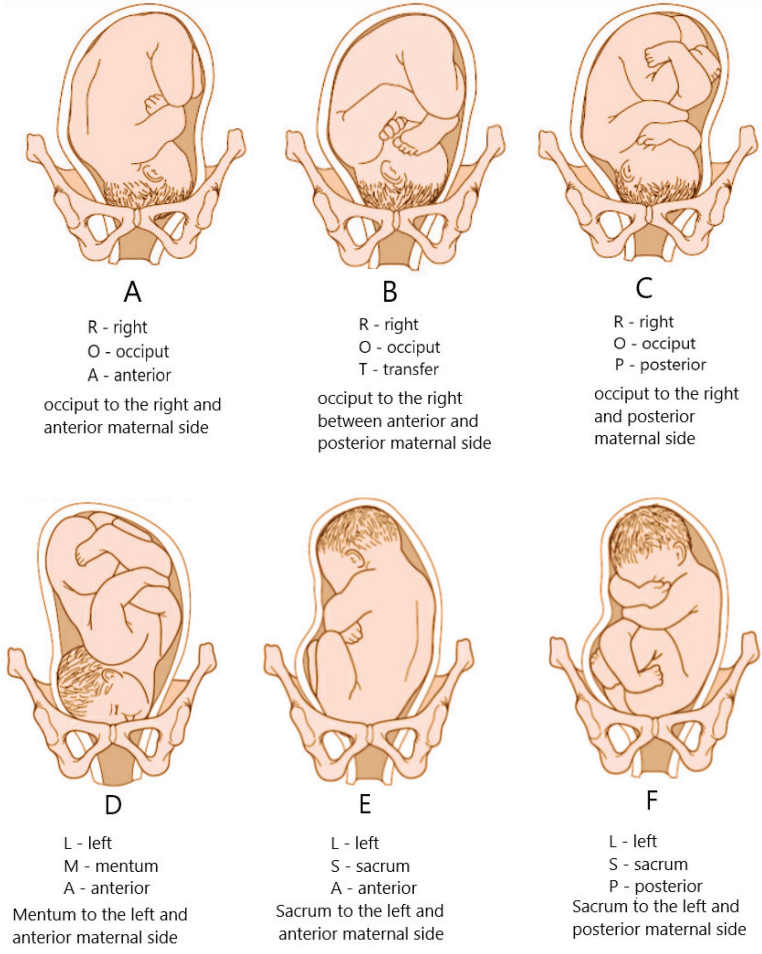


Figure 2.7. Fetal position classification.

Table 2.2

Definition between normal position of the fetus and malposition

Fetal position parameters	Normal	Malposition/ malpresentation
Fetal lie	longitudinal	oblique, transverse
Presentation	vertex, occiput (both cephalic)	brow, face (both cephalic) breech
Attitude	flexion	extension
Position	anterior left or right	posterior left or right
Fetal size of the presented part	Minimal	Increased

☛ Maternal and Fetal Conditions That Can Lead to Fetal Malpresentation

Most commonly malpresentation can be explaned by inharmonic relations between maternal birth canal and fetal sizes. Therefore, the incidence of malpresentations is most high in preterm birth (too small baby for the pelvis) and multiple pregnancies (when the pelvic inlet is clearly small for several fetuses).

Table 2.3

Maternal and fetal factors leading to malpresentation

Maternal factors	Fetal factors
• Contracted (small) pelvis • Over distended abdominal muscles (in multigravidas) • Uterine fibroids, which can block the entry to the pelvic passageway • Uterine malformations, which not allow normal contraction • Abnormalities of placental size or location	• Prematurity • Fetal growth restriction • Multiple pregnancy • Fetal abnormalities that are increasing or decreasing fetal sizes • Polyhydramnios, which allow fetus easily change position and presentation inside

Effects of Malpresentation on Labor

• Weak and irregular contractions

• More frequently occurring prolapsed cord

• Long labor, which can be hard on the fetus, increasing the possibility of anoxia and intrauterine death

• Increased incidence of forceps and cesarean birth

- Failure of presenting part to descend
- Increased risk of uterine rupture
- Increased risk of infection
- Increased blood loss
- Tissue damage because of lacerations and bruising

For all patients who have a breech presentation or any presentation that does not fit the pelvis well or is not settled well into the pelvis, it is essential to inspect the perineum, listen to fetal heart tones, and conduct a vaginal examination as soon as the membranes rupture.

*When the presenting part fails to fit the pelvic inlet closely, the danger of a **prolapsed cord** exists.*

Once the cord is out of the uterus or vagina, the fetal blood and oxygen supply can be blocked because of a drop in temperature, spasm of the blood vessels, or compression between the pelvic brim and the presenting part. When a prolapsed cord occurs, a delay of more than 30 minutes in delivering the baby increases fetal mortality fourfold

To diagnose the **cord prolapse** *vaginal examination* should be performed in the following situations (*after the membrane rupture*):

- There is unexplained fetal bradycardia
- High presenting part
- Malpresentation
- The baby is premature
- There is a twin gestation

Review questions

1. Match the definition with the correct term

1. Normal birthweight (NBW)	a) < 1000g
2. Low birthweight (LBW)	b) 1000 - 1500g
3. Very low birthweight (VLBW)	c) 1500 – 2500g
4. Giant or Very high birthweight (VHBW)	d) 2500 – 4000g
5. Macrosomic or High birthweight (HBW)	e) 4000 – 4500g
6. Extremely low birthweight (ELBW)	f) >4500 (>5000) g

2. Insler and Bernstein's or Jordania *(in Russia)* **formula:**

_____

3. Hadlock's formula includes

a) _____

b)_____

c) _____

4. Explain how it is possible for the fetal head to fit through the rigid, bony pelvis

_____

5. The posterior fontanelle closes approximately _____ months after birth. It is _____ shaped and can be felt when the head is _____ flexed.

6. The anterior fontanelle closes approximately _____ months after birth. It is _____shaped and can be felt when the head is _____.

7. Match the definition with the correct term

1. Relationship of the long axis of the fetus to the long axis of the mother	a) position
2. Part of the fetal body that is more close to the pelvic inlet	b) attitude
3. The relationship of fetal parts to one another	c) presentation
4. The relationship of the fetal back to the front, side or back of the mother's uterus	d) lie

8. The only normal lie is _____.

9. A longitudinal lie can be, when the _____ or_____ come first.

10. Why is vaginal delivery impossible with a transverse lie?

_____

_____

11. The only normal attitude is _____

12. Why is a fetus positioned in **extension** often not deliverable vaginally?

_____

_____

13. The two primary types of presentations are:

a) _____ (approximately 96%)

b) _____ (3% to 4% of pregnancies)

14. The only **normal presentation** is _____, when the _____ presents first.

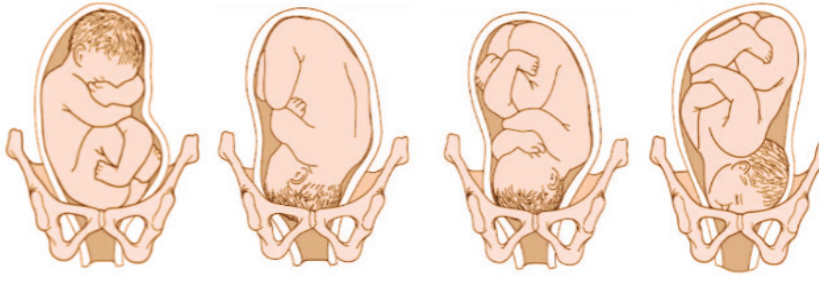
15. State the denominator used to describe the fetal position in each of the following presentations.

a) vertex_____

b) face _____

c) breech _____

16. Fully describe each of the following according to **fetal lie, presentation, and position**.



_____

_____

_____

17. State three most common methods to determine **fetal position and presentation**

_____
_____
_____

18. State at least four maternal or fetal factors that can lead to malpresentation.

1.	5.
2.	6.
3.	7.
4.	8.

19. Why is it critical that you be able to recognize a breech presentation?

_____
_____

REVIEW ANSWER KEY

1. 1d 2c 3b 4f 5e 6a
2. EFW(g) = SFH (cm) ×AC (cm)
3. fetal head circumference; abdominal circumference; femur length
4. The head flexes and the bones of the scalp mold somewhat
5. 3; triangular; well
6. 18; diamond; moderately
7. 1d 2c 3b 4a
8. Longitudinal
9. Head; buttocks
10. Because the size of the fetus is much bigger then pelvic inlet diameters
11. Flexion
12. Because the size of the presented head is increased by extension
13. Cephalic; breech
14. Cephalic; vertex

15. a) Occiput; b) Mentum; c) Sacrum

16. a) Longitudinal (breech) lie, Breech presentation, RSP b) Longitudinal (cephalic) lie, Cephalic presentation, LOA c) Longitudinal (cephalic) lie, Cephalic presentation, LOP d) Longitudinal (cephalic) lie, Cephalic presentation RMT (or RMA)

17. abdominal inspection and palpation, vaginal examination, ultrasonography

18. maternal factors are a contracted pelvis, lax abdominal muscles, uterine tumors blocking entry to the pelvic passageway, uterine malformations preventing efficient labor, and abnormalities of placental size or locations.

Fetal factors are breech or transverse lie, abnormal fetal attitude, multiple pregnancy, fetal abnormalities, and polyhydramnios.

19. A prolapsed cord can occur. The prolapsed cord can result in blockage of blood supply to the fetus, severe hypoxia and fetal death.

Practical part

During the practical class you will need to

1. calculate the estimated birth weight,
2. provide palpation of the fetal head and define type of the presentation, also
3. show the fetal lie, position, presentation and attitude on phantom.

The example of the card with your task

Mrs. C., G3P2, 38+4 weeks gestation is presented to the maternity clinic complaining of regular uterine contractions lasting three hours. On examination her symphysiofundal height is 38 cm, abdominal circumference 98 cm. Palpation using Leopold maneuvers shows presentation is cephalic, position is left and anterior. Fetal head is engaged3/5. You are invited to palpate the fetal presenting part:

1. calculate the estimated birth weight

2. describe your findings and define the type of presentation

3. show the fetal lie, position, presentation and attitude on the fetal phantom and the mother's bone pelvis

The check list example

Date		Student's name	
The passenger: Fetus		Task number	

N.	Tasks	Ratings		
		Mostly correct	**Correct but complete answer**	**Correct complete answer**
1	Calculation of the estimated birth weight with explanation of the used formula			
2	Palpation of the fetal head, description of the findings, definition of the presentation type			
3	Showing the fetal lie, position, presentation and attitude on the fetal phantom and the mother's bone pelvis			

MODULE 2. EXAMINATION OF THE PREGNANT WOMAN ADMITTED TO THE LABOR UNIT

Practical class 3. Identifying Critical Information

When you will finish the class, you will be able to

1. ask the woman being admitted to the labor unit key questions
2. provide history taking in a correct manner
3. estimate the individual risk factors for the laboring woman

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Brief explanation or definition of the term
LMP (last normal menstrual period)	*Последняя нормальная менструация*	
EDD (expected date of delivery)	*Ожидаемая дата родов*	
Gravida	*Беременная*	
Nulligravida	–	
Primigravida	*Первобеременная*	
Multigravida	*Повторнобеременная*	
Abortion	*Аборт*	
Viability	*Жизнеспособность*	
Parity	*Паритет родов*	
Nullipara	*Нерожавшая*	

Primipara	–	
Multipara	*Повторнородящая*	
Grand multipara	*Многорожавшая*	
TPAL system (T - term, P - preterm, A - abortions, L - live births)	*Нет аналога* *term – доношенные* *preterm – недоношенные* *live births - живорожденные*	
Pregnancy age	*Срок гестации*	
Precipitous labor	*Быстрые (стремительные) роды*	
Stages of labor	*Периоды родов*	
Diabetes	*Диабет*	
Shoulder dystocia	*Дистоция плечиков*	
Apgar score	*Шкала Апгар*	
Preeclampsia	*Преэклампсия*	
Eclampsia	*Эклампсия*	
Placental abruption	*Преждевременная отслойка нормально расположенной плаценты*	
Birth trauma	*Родовая травма*	
Fetal hypoxia	*Гипоксия плода*	
Massive blood loss	*Массивная кровопотеря*	
Hysterectomy	*Гистерэктомия*	

Intranatal	*Интранатальный*	
Nonreassuring fetal heart rate patterns	*Патологическая КТГ*	
Meconium	*Меконий*	
Rh-hemolytic disease	*Резус-изоиммунизация Гемолитическая болезнь плода*	
Perinatal loss	*Перинатальная летальность*	
Gestational hypertension	*Гестационная гипертензия*	
Postterm pregnancy	*Переношенная беременность*	
Oligohydramnios	*Маловодие*	
Placenta previa	*Предлежание плаценты*	
Intrauterine growth restriction	*Задержка роста плода*	
Prematurity	*Недоношенность*	
Feto-pelvic disproportion	*Клиническое несоответствие*	
Chorioamnionitis	*Хориоамнионит*	
Premature rupture of membranes (PROM)	*Преждевременный разрыв плодовых оболочек*	

!!! You should also need to be able to use these terms when consulting with other health professionals.

☛ **What information must be identified for the woman being admitted to the labor unit?**

Certain information is needed immediately to evaluate the following:

- *Her general physical condition*
- *Her risk status*

• *The extent of the woman's labor* (this information you will find in the Module 3)

The assessment must be carried out quickly to determine how active the labor is and to become alert to women with a history of rapid deliveries or those with problems denoting risk. Questions to be asked are presented in the Table 3.1 below.

Table 3.1

Information and questions for short assessment of the woman being admitted to the labor unit

Information that you need	Questions to ask the patient	In Russian
Presenting **complain**	*What made you come to the hospital?*	На что жалуетесь?
The **pregnancy age** (better) or at least expected **date of delivery** (EDD)	*How many weeks is your pregnancy now?* *When were you told the baby was due? How it was determined: by dates, by size, by ultrasound*? *During which trimester the ultrasound was performed?**	Какой у вас сейчас срок беременности? Когда ваша дата родов? Как определили срок: по датам, по размеру, по УЗИ? В каком триместре было проведено УЗИ?*
Projection about possible **rapid (precipitous) labor** due to multiparity	*How many babies have you had?*	Сколько раз вы уже рожали?
Stage of labor she is in: **Frequency, duration, and intensity** of contractions	*When did your labor begin?* *How far apart are the contractions? Have they changed in intensity?*	Когда появились схватки? Через сколько минут у вас схватки? Они стали сильнее со временем?
Identification of **abnormal bleeding** versus bloody show	*Have you had any bleeding?*	У вас было кровотечение?
Whether or not **membranes** have ruptured Risk of chorioamnionitis owing to prolonged rupture of membranes Presence or absence of meconium-stained or bloody amniotic fluid	*Have the membranes broken (do you have liquid vaginal loss), and when did it occur?* *What color was the fluid?*	У вас отошли воды? когда это произошло? Какого они цвета?

Any **complications of the pregnancy** specifically ask about problems with blood pressure (BP), bleeding, or infections	*How has your pregnancy been?* *Did you have any problems that required special treatment?* *Have you had hypertension?*	Как развивалась ваша беременность? У вас были осложнения беременности, которые потребовали лечения? У вас есть повышение артериального давления?
Extent of **gastric fullness**	*When did you last have anything to eat or drink? What were these foods?*	Когда вы последний раз ели или пили? Что это было?
Any known **allergies** to drugs	*Are you allergic to any foods or drugs that you know of?*	У вас есть аллергия на продукты питания или лекарства?
Presence of a support system	*Who has come with you?* *Will they be staying with you during labor?*	Кто приехал вместе с вами? Они останутся на роды?
Knowledge level regarding the **birth experience**	*Have you had any preparation for this labor and delivery?*	Вы как-то готовились к родам?
To elicit **information that could affect her labor/delivery or the newborn** Opportunity for woman to share specific concerns regarding her care	*Is there anything special about your pregnancy that I should know?*	Есть что-нибудь относительно вашей беременности, что мне нужно знать?

**__Dating criteria__: Ultrasound confirmation of gestational age should agree with menstrual dates within 4 days when performed at 6 to 9+6 weeks; within 7 days at 10 to 13+6 weeks or within 10 days when performed at 14 to 20 weeks. Dating after 20 weeks by ultrasound is not completely accurate.*

While you are history taking:

• Maintain eye contact.

• Introduce yourself and confirm the name by which the woman wishes to be called.

• Inform the woman that you need to ask several questions and that you will stop whenever a contraction begins.

• Ask open-ended questions when possible. This type of question will give you more information.

For example, "Can you tell me about any problems you have had during this pregnancy?" instead of "Have you had an infection (or problem) during this pregnancy?" and "What preparation have you had for your labor and delivery?" instead of "Have you attended childbirth preparation classes?"

But in the case when patient is confused by the question you may use more specific questions mentioned above.

• When you are happy that you have all the information you require, and the patient has asked any questions that she may have, you must thank her and clearly explain what will happen to her next. *If you are medical student, you may say that one of the doctors will be coming to see her soon.*

☛ How can you identify a mother and fetus who are at risk?

Mothers at high risk for pregnancy complications tend to give birth to children at high risk for neonatal complications. These patients should be identified as early as possible on admission to the maternity ward.

Taking a good history and reviewing the prenatal record of the woman when she is admitted to the labor unit is necessary for identifying the high-risk intrapartal patient. Risk status may have changed in the period between the last prenatal visit and admission for delivery.

Assessment on admission and throughout the labor process will help to identify these women in a timely manner.

Women who are at low risk early in pregnancy may develop complications that change their risk group during the delivery.

The following factors are associated with the development of complications for either the mother or the baby both during and after delivery (Tab.3.2).

Table 3.2.

Most common risk factors for the labor and post delivery process.

Factors	Potential risk
Factors Identified from the Mother's History	
• Diabetes	Maternal risk with complications of the diabetes – ketoacidosis, diabetic coma, preeclampsia, traumatic delivery Fetal risks: macrosomia, birth trauma, shoulder dystocia, low Apgar score, low serum glucose level
• Preeclampsia or eclampsia	Preeclampsia recurrence
• Chronic hypertension	Severe hypertension, stroke, placental abruption, preeclampsia
• Heart disease	Cardiac insufficiency, cardiac failure, etc.
• Rh sensitization	Rh-hemolytic disease in fetus, fetal hypoxia
• Anemia, Sickle cell disease	Fetal anemia, chronic hypoxia, IUGR
• Previous perinatal loss	Recurrence of the perinatal death
• Renal diseases: Glomerulonephritis Pyelonephritis Chronic kidney disease	Urinary tract infection, pyelonephritis, urine stasis, kidney failure, chorioamnionitis
• Sexually transmitted infections • Group B streptococcus (GBS) carrier status	Infection of the fetus during passage through birth canal
Women who are partners of intravenous drug abusers, bisexual males, or those who have multiple partners exhibit high-risk behavior for sexually transmitted diseases, some of which could be life threatening to both the mother and the fetus. Screening for syphilis, hepatitis B, and HIV infection, and possibly Hepatitis C, is strongly recommended.	
Factors That Develop During Pregnancy	
• Preeclampsia • Gestational hypertension	Risk of eclampsia, stroke, placental abruption, postpartum excessive bleeding, multiorgan failure
• Postterm pregnancy	Maternal and fetal birth trauma, fetal hypoxia, neonatal asphyxia
• Hydramnios	Fetal hypoxia, maternal poor labor progress, risk of perinatal infections
• Oligohydramnios	Fetal hypoxia, perinatal infections

• Abruptio placentae • Placenta previa	Maternal massive blood loss, risk of hysterectomy, fetal severe hypoxia, even death
Factors Related to the Fetus	
• Nonreassuring fetal heart rate patterns • Significant increase or decrease in current fetal activity • Meconium-stained amniotic fluid	Fetal intranatal severe hypoxia, even death
• Intrauterine growth restriction	Fetal intranatal severe hypoxia
• Prematurity	Fetal malpresentations, fast delivery, need for neonatal resuscitation and intensive care
• Malpresentation	Birth trauma, feto-pelvic disproportion
Factors Developing During Early Labor	
• Chorioamnionitis • Premature rupture of membranes (PROM)	Prolong delivery, obstetric sepsis, neonatal sepsis
• Suspected cephalopelvic disproportion	Birth trauma, feto-pelvic disproportion

The presence of any high-risk factors requires that the mother and fetus be continually evaluated throughout labor.

Review questions

1. List three types of information you need to elicit from a woman being admitted to the labor unit.

a. _____
b. _____
c. _____

2. Which of the following factors predict a strong possibility of problems developing for the mother or infant during or after labor and delivery? Select all that apply.

a. Maternal history of heavy smoking
b. Fresh, meconium-stained fluid

c. Onset of labor
d. Fetal tachycardia
e. Multiple pregnancies
f. Mild anemia
g. Prematurity

3. A birth occurring before ____ completed weeks' gestation is identified as preterm.

4. A fetus of more than ____completed weeks' gestation (postterm) is considered high risk.

5. A 33-year-old woman who presents for prenatal care is described as a G5P1, TPAL annotation: 1212. From this information you recognize she needs counseling regarding the risks of which of the following?

a. Grand multiparity
b. Advanced maternal age
c. Recurrent preterm birth
d. Recurrent pregnancy loss

6. Among women with a normal body mass index prior to pregnancy who have less than 10 kg of gestational weight gain, which complication is increased?

a. Preeclampsia
b. Cesarean delivery
c. Large-for-gestational-age infant
d. Small-for-gestational-age infant

REVIEW ANSWER KEY

1. Her general physical condition, her risk status, is she in labor now?
2. b, d, e, g
3. 37
4. 42
5. c
6. d

Practical part

In the practical class you will need to work in pairs with a group mate, one of you will be a medical student, the other a pregnant woman. Each of you will receive your own task card. You need to discuss your task together and then show the history taking interview and answering to the questions to the group.

The example of the task card (if you are "medical student")

1. interview the "patient" (your group mate who recieved a card with a case to play this role) according to the scheme given in the theoretical part of the class
2. calculate her pregnancy age
3. estimate EDD
4. estimate the risk group of the patient using Fetal Medicine foundation calculators (https://fetalmedicine.org) for the preeclampsia risk, preterm birth risk, small for gestational age.

The example of the task card (if you are "patient")

You need to answer the questions of your group mate, but note that if he did not ask you about some pathology, do not name it until you get a special question. If you have any doubts - ask the teacher to help you.

You are Mrs. C., 25 years-old G3P2-0-0-2, presenting to the maternity clinic complaining of regular uterine contractions lasting three hours.

You are in a spontaneous pregnancy, your LMP was 34 wks ago, but early ultrasound before (10 wks) was 6 days more.

Last baby was born at 37 wks 2 years ago with birthweight 2300g that pregnancy was complicated by mild preeclampsia, previous born at 38 wks with birthweight 3100g. Cervical length measurement at 20-26 weeks – 23 mm. you have no family history of the preeclampsia. You have diabetes mellitus 2 type, controlled by only diet and physical activity. Your blood pressure is above 135/80-140/90. Uterine artery pulsatility index last time was 0.9.

The check list example

Date		Student's name	
Examination of the Pregnant Woman		Task number	

N.	Tasks	Ratings		
		3	**4**	**5**
1	Interview of the "patient" *			
2	Calculation of the pregnancy age**			
3	Estimation of the EDD**			
4	Estimation of the patient's general risk group***			
	using Fetal Medicine foundation calculators			
	preeclampsia risk***,			
	preterm birth risk***,			
	small for gestational age***.			
5	Total score:			

Ratings	*3*	*4*	*5*
*	*70 - 80% of questions were asked*	*80 - 90% of questions were asked*	*More than 90% of questions were asked*
**	*Calculation correct no explanation*	*Correct calculation explanation is not complete*	*Correct calculation and full explanation of the method*
***	*Mostly correct*	*Correct with not complete explanation*	*Correct with complete explanation*

Practical class 4. Physical Examination of the Laboring Woman

When you will finish the class, you will be able to

1. provide physical assessment for the laboring woman
2. provide vaginal examination
3. discuss and estimate cervical effacement, dilatation, fetal station and presentation during labor

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Brief explanation or definition of the term
Chaperone	–	
Vena Cava (Supine Hypotension) Syndrome	*Синдром нижней полой вены*	
Dehydration	*Обезвоживание*	
Fundal Height	*Высота стояния дна матки*	
Engagement	*Вставление*	
Doppler Ultrasound Probe	*Допплеровский ультразвуковой датчик*	
Speculum Examination	*Осмотр в зеркалах*	
True labor	*Родовая деятельность (роды)*	
Fetal Station	*Положение головки плода*	
Proteinuria	*Протеинурия*	
Genital Herpes	*Генитальный герпес*	
Meconium-Staned Liquor	*Воды, окрашенные меконием*	

Episiotomy	*Эпизиотомия*	
Bartholin's Cyst	*Киста бартолиновой железы*	
Varicose Veins	*Варикозные вены*	
Cusco's Speculum	*Зеркало Куско*	
External Cervical Os	*Наружный зев шейки матки*	
Ectropion	*Эктропион (выворот)*	
Vasa Previa	*Предлежание сосудов*	
Nitrazine Test	*Нитразиновый тест*	
Bloody Show	*«Шеечные» кровянистые выделения*	
Syphilis Chancre	*Сифилитический шанкр*	

You should be able to recall the meaning of the following terms. You should also be able to use the terms when consulting with other health professionals

This section details how to perform a modified physical examination to screen for problems in the woman being admitted to labor and delivery. Study this section and then attend a skill practice and demonstration session. You will need to demonstrate the examination and correctly interpret the results.

☛ **Preparation for the Examination** is explaned in the table 4.1 below.

Table 4.1

Preparation to the obstetric examination by steps with explanation

Steps	Explanation	Russian
1. Wash your hands		
2. Introduce yourself to the patient including your **name** and **role**		
3. Confirm the patient's **name** and **date of birth**		
4. Briefly **explain** what the examination will involve using **patient friendly language:**	*Today I need to examine your tummy as part of the assessment of your pregnancy. This will involve me looking and feeling the tummy, in addition to performing some measurements. Although it may be a little uncomfortable, it shouldn't be painful. If at any point you'd like me to stop then please just let me know.*	*Сегодня мне нужно осмотреть ваш живот для оценки вашей беременности. Это потребует ощупывания живота и выполнения некоторых измерений. Хотя это может быть немного неудобно, это не должно быть больно. Если в какой-то момент вы захотите, чтобы я остановился, пожалуйста, просто дайте мне знать*
5. Provide the patient with the opportunity to **pass urine** before the examination.		
6. Offer a **chaperone**. **Gain consent** to proceed with the examination:	*Do you understand everything I've said? Are you happy for me to carry out the examination?*	*Вы понимаете все, что я сказал? Вы не против, что я провожу исследование?*
7. Position the patient on the clinical examination couch with the head of the bed at a **30-45° angle** for the initial assessment.		
8. Adequately **expose** the **patient's abdomen** for the examination from the pubic symphysis to the xiphisternum (offer a blanket to allow exposure only when required).		
9. Ask the patient if they have any **pain** before proceeding with the clinical examination.		
10. Unless you have a **checklist** chart your findings in the same order you were conducting the examination		

☛ **When is the best time to perform the physical examination?**

The initial assessment is caried out immediately to evaluate the labor and any signs of problems.

The examination is conducted as quickly as possible. The woman can then assume a *side-lying* or *upright siting* position. Cardiac output is better for the mother, and uteroplacental circulation for the fetus is optimized in these positions. In the supine position the *vena cava (supine hypotension) syndrome* is usual, that need to be avoided.

Early and careful assessment of the patient's physical status will provide dues to problems. Give thoughtful attention to the **general appearance** of the patient. Note the following (Tab. 4.2):

Table 4.2

Steps in general appearance estimation in a laboring woman.

General appearance	Explanation
Signs of distress, facial expression, state of awareness	The woman who comes to the labor unit in active labor might appear stressed because contractions are strong and frequent. Note how she is coping with them-whether she is using a *breathing technique* or tensing up. You can reinforce her technique or teach her an effective one.
Skin color	If the skin is pale, this may be a sign of anemia, and since any childbirth will be accompanied by blood loss, it is necessary to first establish the status of anemia in order to carry out preventive measures Red skin color may be a symptom of fever. Any infection is potentially dangerous during labor, especially chorioamnionitis that can be a cause of maternal and neonatal sepsis
Personal hygiene, Odor	Low hygiene, presence of unpleasant odor are supportive for infection process
Maternal weight and height	Increased BMI (body mass index) is a strong risk factor for most of the obstetrical complications. Height of the woman less than 150cm is a risk factor for the contracted pelvis
Vital signs	
Blood pressure	Be sure to assess BP between contractions. The cuff must fit snugly on the arm and be of appropriate size. Take BP measurements with the woman in a sitting position. The patient may have a hypertensive disorder if the BP is: 140/90 mm Hg (mild hypertension) or higher 160/110 mm Hg (severe hypertension).

	Hypertension is common for preeclampsia and additionally proteinuria need to be checked. Ask the mother if she is having headaches or blurred vision or epigastric pain (high risk of eclampsia). Assessment for HELLP syndrome which includes hemolysis, low platelets, and elevated liver enzymes can be seen often in preeclampsia and can be a life-threatening complication.
Pulse	Normal range, 60-90 bpm Increased pulse rate can result from excitement, anxiety, dehydration, pain, and, in rare cases, cardiac problems.
Respirations	Avoid counting respirations during a uterine contraction because they can be abnormally high or low as a result of stress or because of the use of a breathing technique.
Temperature	Temperature > 37.60C may be a sign of infection or dehydration

☛ Abdominal examination

Ask the mother to lie down on her back and bend her legs at the knees, with her feet flat on the bed. You need to be able to move around her: sometimes you will be palpating her abdomen while standing at her feet and looking up her body towards her head; sometimes you will be standing behind her and facing her feet; and sometimes you will stand beside her.

How to perform fundal height

Fundal height (symphysial-fundal height) is the distance between the fundus and the upper border of the pubic symphysis. After *20 weeks gestation*, the symphyseal-fundal height should correlate with the *gestational age* of the fetus in weeks (+/- 2cm).

To measure the ***symphysial-fundal height***:

Begin palpation of the abdomen just inferior to the xiphisternum using the ulnar border of your hand (Figure 4.1 A). Locate the fundus of the uterus (a firm feeling edge at the upper border of the bump). Once the fundus has been identified, locate the upper border of the pubic symphysis. Measure the distance between the upper uterine border and the pubic symphysis in centimetres using a tape (Figure 4.1 B).

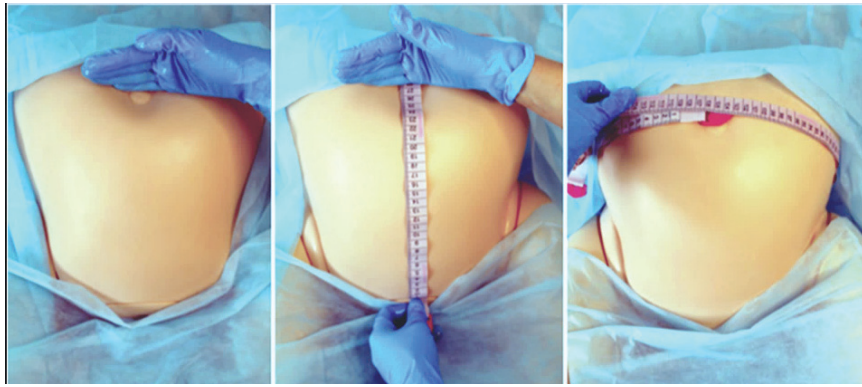


Figure 4.1 Symphysial-fundal height and abdominal circumference measurement. A. Palpation of the uterine fundus. B. Measurement with centimeter tape C. Abdominal circumference measurement.

The distance measured should correlate with the gestational age in weeks (+/- 2cm) (Figure 4.2). To avoid bias, it's best to place the tape measure facing down and only turn to view the numbers once in position.

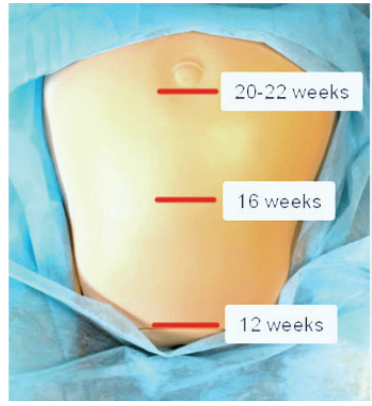


Figure 4.2. Symphysial-fundal height at different gestational ages.

Maternal ***abdominal circumference*** is measured at the level of the umbilicus (Figure 4.1 C). It may be used for clinical estimation of the Expected Birth Weight (EBW) in cases when ultrasound is not available (see practical class 2).

How to assess the frequency and duration of contractions

Put your hand over the mother's abdomen, around the fundus. You will sense the abdomen starting to tighten and become hard. The mother may make 'pain' sounds with the contraction. Count the frequency, i.e. number of contractions in 10 minutes, and the duration (the time elapsed during each contraction in seconds).

How to perform palpation

There are four steps, which are commonly referred as ***Leopold's maneuvers***. You need to do them in the *correct sequence.*

First Leopold's maneuver: fundal palpation

The purpose of palpating the fundus in a laboring woman is to discover how the baby is lying in the uterus. Nearly the same maneuver we use to measure *fundus height*.

Use the palms of both hands to palpate on either side of the fundus, with your *fingers quite close together* (Figure 4.3). Feel whether the top part of the uterus is hard and rounded or soft and irregular. Usually, shapes feel soft and irregular and they don't easily move under gentle pressure from your hands, it means the baby's buttocks are occupying the fundus and it is 'head-down'. This is *cephalic presentation* (cephalic means head).

Figure 4.3. First Leopold's maneuver

Second Leopold's maneuver: lateral palpation

The second maneuver helps you to discover the *fetal lie*: is the baby lying *longitudinally* (straight), *obliquely* (diagonally across the uterus), or *transversely* (horizontally)?

The only longitudinal lie is normal as it presents the baby in its smallest size. A *transverse* or an *oblique lie* in labor should be referred urgently; the baby cannot be born through the vagina in this position because of increased sizes and may need caesarean surgery to deliver it.

Place your hands on either side of the middle of her abdomen. Push gently with one hand while holding the other hand firm to steady the uterus; alternate the pressure between your two hands. Usually, you can feel a large smooth shape under one hand, this is probably the baby's back, which means it is facing inwards. Note what is maternal side you are feeling the fetal back – this is important to classify its position left-anterior or right-anterior (Figure 4.4).

If you can feel small irregular 'lumps' under your hands, these are probably the baby's feet, knees and elbows and it is facing outwards.

You also may feel the round, hard shape of the baby's head at one side, and fetal buttocks on other side both above ileum spines, note the fundus *feels empty* – this is *transverse lie*. If you feel one *massive part* (fetal head or fetal buttocks) one above and one below the *ileum spines* – this is ***oblique lie***. In transverse or oblique fetal lie case you need refer the mother urgently.

Figure 4.4. Second Leopold's maneuver

Third Leopold's maneuver: grip of the presenting part of the fetus

The third maneuver helps to confirm your earlier findings about the fetal presentation—is it cephalic or breech?

First place the thumb and forefinger apart on the lower abdomen (see Figure 4.5A), then move them to grasp the presenting part of the fetus (Figure 4.5B). If it is *hard and round*, the presentation is *cephalic*; if it is *softer and irregular*, suspect a *breech presentation*.

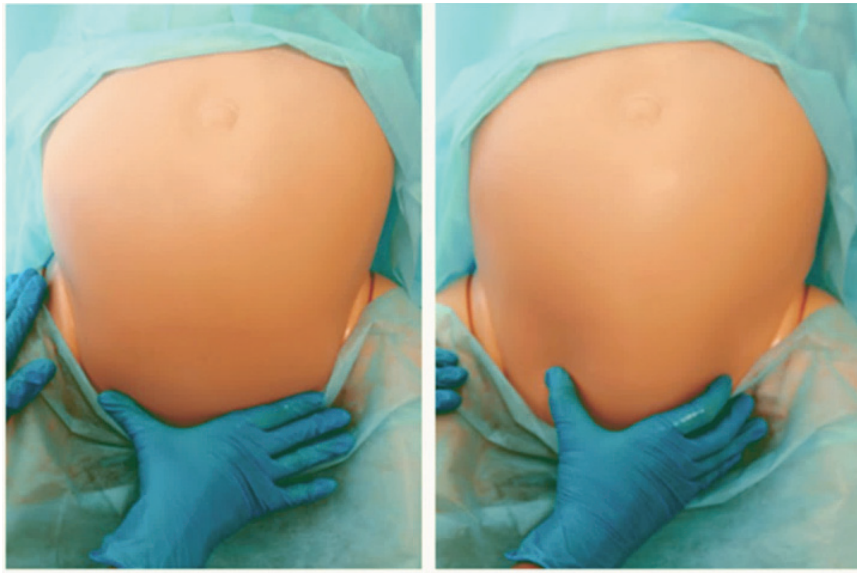


Figure 4.5. Third Leopold's maneuver or Pawlick's grip.
A. Start of the maneuver B. Fixation of the presenting part.

! Second – try *to move left and right the presenting part* of the fetus (head or the buttocks) to check is it *engaged* to the *pelvic inlet*: if it is moving – it is not engaged, if it not moving – fetal head (or sacrum) is engaged.

Pawlick's grip

The purpose of the maneuver is to help determine whether the fetal head (in a cephalic presentation) has descended into the mother's pelvis and engaged in the cervix. The extent of engagement is estimated by how

many fingers you can grip the fetal head with. If all five fingers can grip the fetal head just above the mother's pubic bone, the head is not yet engaged. When you can only grip it with the width of two fingers, the head is engaged (Fig 4.6).

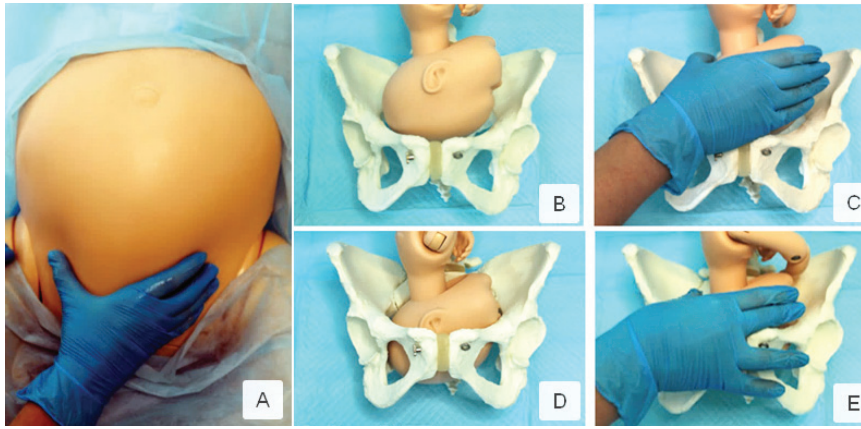


Figure 4.6. Assessment of the fetal head descent by Pawlick's grip. A. Pawlick's grip. B, C – fetal head is completely above the pelvic brim. D, E – only by two fingers above the pelvic brim fetal head is palpated.

The WHO guideline explains: "By abdominal palpation, assess descent *in terms of fifths of fetal head palpable above the symphysis pubis*: a head that is *entirely above* the symphysis pubis is *five-fifths (5/5) palpable*; a head that is *entirely below* the symphysis pubis is *zero-fifths (0/5) palpable* (Fig 4.7).

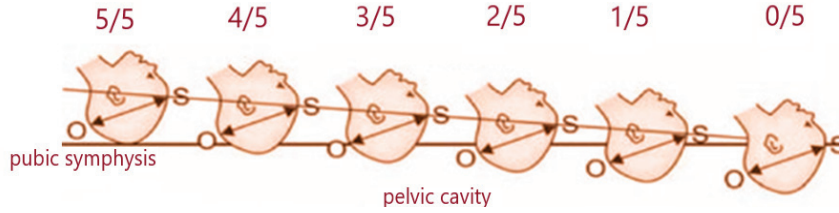


Figure 4.7. Assessment of the descent in terms of fifths of fetal head palpable above the symphysis pubis. 5/5 – fetal head is palpated by 5 fingers above pubic symphysis, 4/5 – fetal head is palpated by 4 fingers above etc.

When there is a significant degree of caput molding, assessment by abdominal palpation using fifths of head palpable is more useful than assessment by vaginal exam.

Fourth Leopold's maneuver: deep pelvic palpation

Turn and face the maternal feet. Move your hands to the sides of the maternal abdomen. Using your palmar surfaces, move tips of your fingers down toward to the symphysis and into the pelvic inlet. Attempt to locate the cephalic prominence (fetal brow). If the head presents, one hand is arrested sooner than the other by a rounded body (the cephalic prominence) while the other hand descends deeply into the pelvis (Fig 4.7).

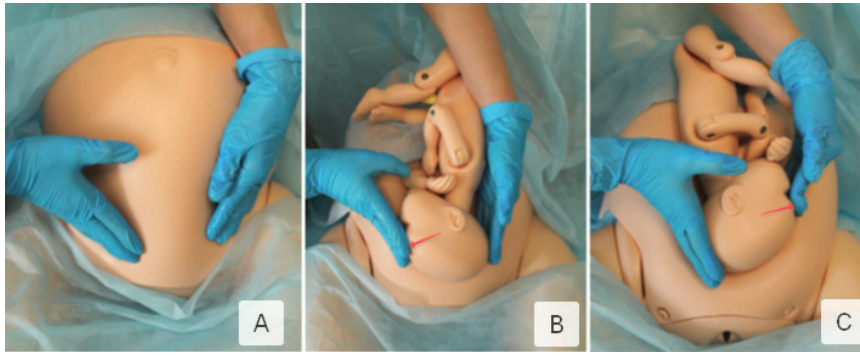


Figure 4.7. Fourth Leopold's maneuver. A – how to perform the maneuver. D and C – shows different position of the fetal brow (red arrow), cephalic prominence is above another hand.

If the *cephalic prominence is on the same side as the small parts*, then the fetus is in *vertex presentation*. If the cephalic prominence is on the *same side as the back*, then the head is extended and the fetus is in extended *face presentation*.

! Notice by this maneuver you also may assess whether the head is free or floating and how deep it is engaged (Fig. 4.8).

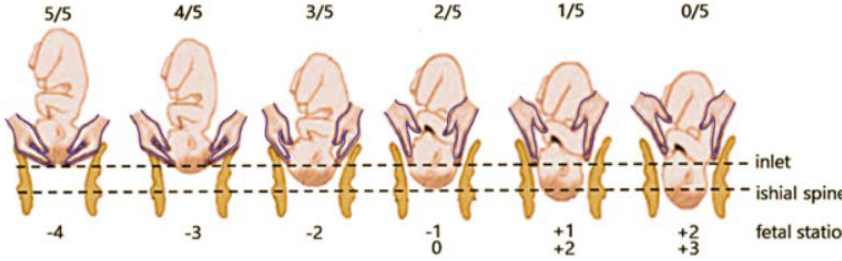


Figure 4.8. Assessment of the descent by fourth Leopold's maneuver

How to asses fetal heart tones

Usually, the **fetal heartbeat** is assessed using a Pinard stethoscope (after 24th gestational week), but a new, easier method is a Doppler ultrasound probe (Fig 4.9), that can be used after 12 weeks of gestation.

Figure 4.9 A - Pinard stethoscope (a hollow horn, often made of wood or metal, about 8 inches (200 mm) long. It functions similarly to an ear trumpet by amplifying sound. The wide end is held on the maternal abdomen while the clinician listens through the flat end).

B - Doppler ultrasound probe (an electronic device that uses ultrasound technology to detect fetal heart motion and converts the ultrasound information into a cardiac activity parameter (baseline heart rate, variability, accelerations (short episodes of tachycardia), descelerations (variable episodes of bradycardia)).

In all cases, it is important to have a basic understanding of how to locate and identify the fetal heartbeat.

Between the 10th and 16th weeks *of pregnancy use Doppler fetoscope. Apply a small amount of conduction gel on the probe and start listening from the upper border of the pubic hair. If you don't listen to the fetal tones, slowly move the instrument up to the mother's umbilicus. Only light pressure is needed. Also you may add gel if more search is needed.*

Between 16th and 24th weeks *of pregnancy also use Doppler probe, but start listening from the point 4cm above the upper border of the pubic hair. Move up by the midline for the fetal heart tones search.*

After 24th week *of pregnancy start from the assessment of the fetal position*

Based on your assessment of the fetus's position, you should place the Pinard stethoscope (or a Doppler fetoscope) aiming between the fetal shoulders on the fetal back (Fig. 4.10).

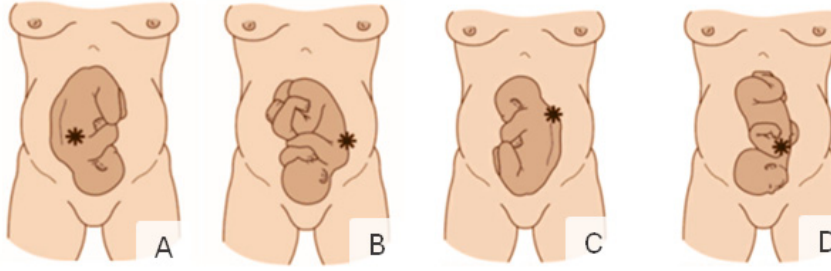


Figure 4.10 Position of the Pinard stethoscope or a fetoscope on the appropriate quadrant of the mother's abdomen in different fetal position. A – ROA (right occiput anterior), B – LOP (left occiput posterior), C – LSA (left sacrum anterior), D – LMA (left mentum anterior).

Palpate the patient's radial pulse (i.e. maternal pulse). Place your ear to the Pinard and *take your hand away* (*so the Pinard is held against the abdomen using your ear only*) (Fig. 4.11).

Figure 4.11 Using the Pinard stethoscope you need held against the abdomen by your ear only.

You should be applying gentle pressure, to ensure a good seal between your ear and the Pinard, as well as between the Pinard and the abdomen. Pressing too hard will be uncomfortable for the patient and pressing too softly will make it difficult to hear anything at all.

Listen for the fetal heartbeat. Normal fetal heart rate is 110-160 beats per minute and it differs from the maternal pulse. If the maternal pulse coincides with the pulse you can hear, you are most likely listening to the flow through the uterine vessels, rather than the fetal heartbeat.

Summarise your **findings**

Example summary

"Today I examined Mrs Smith, a 28-year-old female who is currently at 38 weeks gestation. She seems to have a labor onset 4 hours ago. Till that period her uterine contractions are regular with 1-2 contraction per 10 minutes. On general inspection, the patient appeared comfortable at rest. There was no evidence of edema of the face or peripheries on assessment. Her blood pressure is normal – 120/80 mmHg, pulse rate is 78 bpm"

"Symphysial-fundal height was 36cm, which is in keeping with the patient's current gestation. The fetus was positioned in a longitudinal lie, with a cephalic presentation and left occiput anterior position. The fetal head was three fifths palpable. Fetal heart rate is 140 bpm"

"In summary, these findings are consistent with a normal obstetric abdominal examination. For completeness, I would like to perform the following further assessments and investigations."

Further assessments and investigations

1. Vaginal examination (includes speculum and internal manual)

a. Speculum examination for assessment of perineum, vaginal or cervical pathology, visualization of vaginal discharge (clear fluid, blood, meconium-stained liquor etc.) and taking swabs if needed

b. Internal (vaginal) examination for assessment of cervical effacement, dilatation, station, and fetal presentation in labor

2. +/- Urinalysis: to assess for evidence of proteinuria (pre-eclampsia) and urinary tract infection. Blood count test for evidence of anemia.

3. +/- Ultrasound scan: to assess the position and wellbeing of the fetus.

☛ **Vaginal examination**

In laboring woman the functions of a vaginal examination are to:

1. Confirm if *true labor* has begun and what *phase and stage* it has reached, based on measuring the *dilatation of the cervix*

2. Check for the rupture of membranes and the color of the amniotic fluid (by speculum examination).

3. Assess the size of the *mother's pelvis* and its adequacy for the passage of the fetus

4. Identify the fetal presentation and position

5. Detect any *molding* of the fetal skull bones

6. Assess the progress of labor by the progress in cervical dilatation or the descent of the fetus down the birth canal

How to provide speculum examination

Speculum examination is a common procedure to start the vaginal examination. In laboring woman the purpose of examination is to confirm the *membrane rupture* and as the membranes will be ruptured in all cases during labor process and any other discharges will be seen in process of monitoring it is not obligatory and the procedure itself is usually shorter.

We provide here more advanced version of the procedure that can be potentially used for the nonpregnant women or pregnant women with concern for prelabor rupture of membranes or with complaints for any abnormal vaginal discharges during pregnancy.

As usual speculum examination need preparations that are described in Tab.4.3

Table 4.3

Introduction to speculum examination

Step	Explanation	Russian
To start with you need gather the appropriate equipment:	Gloves Lubricant Speculum A light source Paper towels	Перчатки Любрикант Зеркала Источник света Бумажные полотенца
If it was not done before: Provide the patient with the opportunity to **pass urine** before the examination. Explain to the patient that they'll need to **remove their underwear** and **lie on the clinical examination** couch, **covering themselves** with the **sheet** provided. Provide the patient with **privacy** to undress and **check it is ok to re-enter the room before doing so**.		
Wash your hands		
Explain what the examination will involve using patient friendly language:	*I need to carry out a speculum examination. The procedure will involve me inserting a small plastic device called a speculum into the vagina. This will allow me to visualize the neck of the womb. It shouldn't be painful, but it will feel a little uncomfortable. You can ask me to stop at any point. You may experience some light vaginal bleeding after the procedure.*	Мне нужно провести осмотр в зеркалах. Во время процедуры я введу во влагалище небольшое пластиковое приспособление, называемое зеркалом. Это позволит мне увидеть шейку матки. Это не должно быть больно, но будет немного неприятно. Вы можете попросить меня остановиться в любой момент. После осмотра у вас могут появиться небольшие кровянистые выделения, это нормально
Explain the need for a chaperone:	*One of the female ward staff members will be present throughout the examination, acting as a chaperone, would that be ok?*	Одна из сотрудниц отделения – женщина, будет присутствовать на протяжении всего осмотра в качестве сопровождающей, вы разрешаете?
Gain consent to proceed with the examination:	*Do you understand everything I've said? Do you have any questions? Are you happy for me to carry out the examination?*	Вы понимаете все, что я сказал (сказала)? У вас есть вопросы? Вы не против, что я буду проводить исследование?

Position the patient:	*Bring your heels towards your bottom and then let your knees fall to the sides.*	Подтяните пятки к попе, а затем разведите ноги (колени) в стороны

Vulvar inspection

Don a pair of non-sterile gloves and inspect the vulva for abnormalities:

Ulcers: typically associated with genital herpes.

Abnormal vaginal discharge: blood, pus, meconium-staned liquor.

Scarring: may relate to previous surgery (e.g. episiotomy) or lichen sclerosus (destructive scarring with associated adhesions).

Masses: causes include Bartholin's cyst and vulval malignancy.

Varicosities: varicose veins secondary to chronic venous disease or obstruction in the pelvis (e.g. pelvic malignancy).

Female genital mutilation: total or partial removal of the clitoris and/or labia and/or narrowing of the vaginal introitus.

Speculum examination

Vaginal speculum is a tool for inspecting a vaginal canal. The speculum is composed of two blades and a handle (Fig. 4.12) and has a jaw that opens up like a duck bill. Below you see multi use metallic specula, but nowadays single use plastic specula are more common.

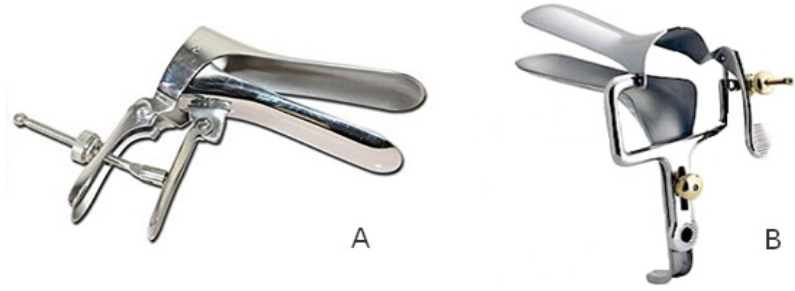


Figure 4.12 Metallic vaginal specula. A – Cusco speculum, B – Graeve speculum

The advantage of Cusco's and Grave specula is that they are *self-retaining*. Therefore, an assistant's help is not needed to keep the speculum in place. By the thumb pressure on upper handle top blade hinged. The thumbscrew (lock) when is turned fixes the top blade in position (Fig. 4.13).

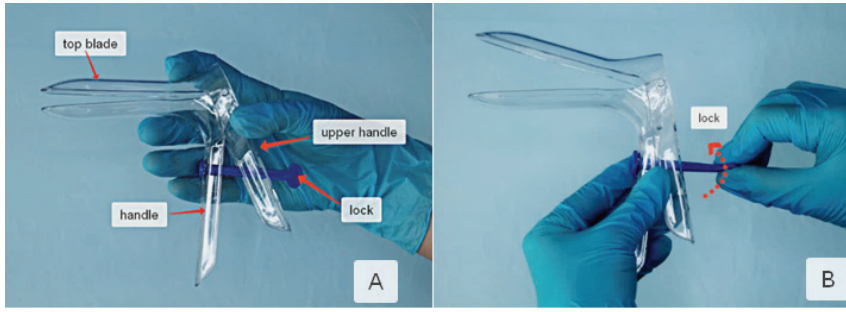


Figure 4.13 Mechanism of opening and fixation of the vaginal specula

When speculum correctly placed in the vagina being opened and fixed it allows a *clear view of the cervix* (Fig. 4.14)

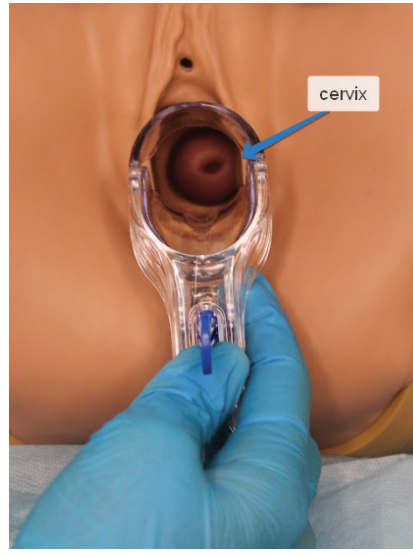


Figure 4.14 Correct placement of the vaginal speculum gives clear view of the cervix.

When all is prepared warn the patient you are going to **insert the speculum** and ask if they're still ok for you to do so. If the patient **consents** to the continuation of the procedure, *lubricate the speculum* and carry out the following steps:

Use your left hand (index finger and thumb) to *separate* the *labia* (Fig 4.15). Gently insert the speculum sideways (blades closed, angled downwards). Once inserted, rotate the speculum back 90° so that the handle is facing upwards or downwards.

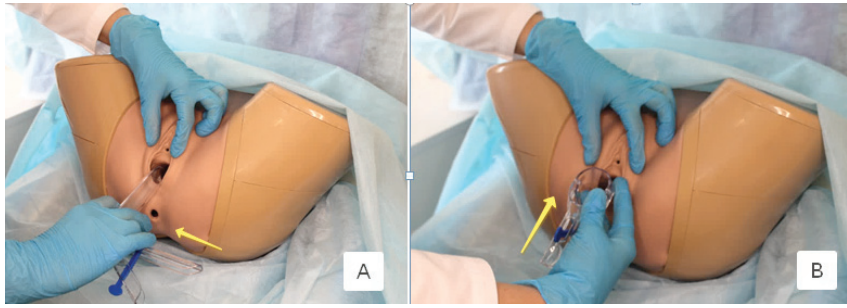


Figure 4.15 Insertion of the vaginal speculum.

Open the speculum blades until an optimal view of the cervix is achieved. Tighten the lock to fix the position of the blades (Fig 4.16).

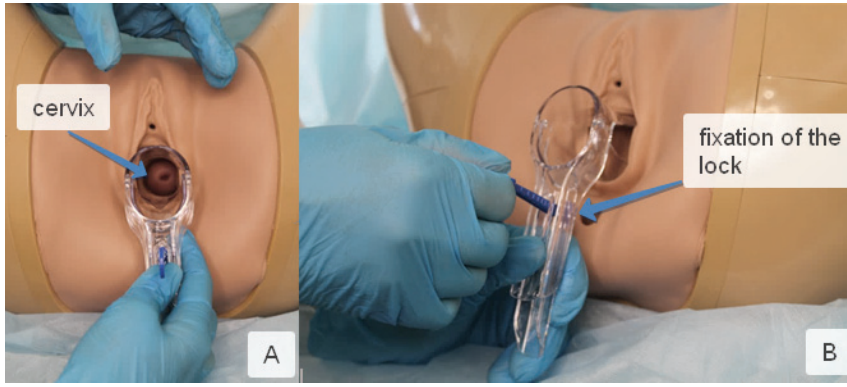


Figure 4.16. The speculum is located correct: A – cervix is visualized clearly, B – lock is closed in speculum opened position.

Inspect the cervix:

Identify the external cervical os: in laboring women it is opened (Fig. 4.17).

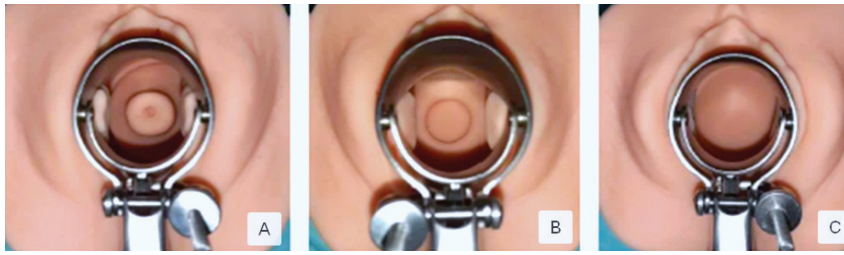


Figure 4.17 The view of the cervix during speculum examination (A – cervix is closed and 0% effaced, B – cervix is 2 cm opened, 80% effaced, C – cervix is fully effaced, 6-7 cm opened)

• Inspect for erosions around the os: most commonly associated with ectropion however early cervical cancer can have similar appearances, but typically it is associated with cervical masses

• Ulceration: most commonly associated with *genital herpes*

• Abnormal discharge: several possible causes including *chorioamnionitis* (if pus with unpleasant odor), potential fetal hypoxia (if deep yellow-green or brown meconium-staned, but not in breech presentation), placental abruption, vasa previa, or just *bloody show* (if blood).

• What you will see if **membranes are ruptured?** *Pooling fluid leaking* from the cervical opening. Viewing *leaking fluid from cervical os* is the best method for determining that membranes are ruptured.

• In confusing cases you may add *Nitrazine test* – obtain a specimen of the suspected leaking fluid by placing the sterile cotton-tipped applicator into pool of fluid accumulating in the lower blade. Remove and moistening well a fresh nitrazine paper. Compare the color of this paper to the standard of the box of Nitrazine paper. Because amniotic fluid is neutral (pH 7.0) or slightly alkaline (pH 7.25) it changes the color of the test paper. Nitrazine test may be false-positive if it will contact to vaginal mucus, discharges in some vaginal infections. (*!)if the woman is not contracting having ruptured membranes – digital vaginal examination may be contraindicated!*

3. To **finish the procedure** you need remove the speculum. All steps need to be done in controversial order. With your non-dominant hand,

hold the blades of the speculum whilst you loosen the locking nut **with your dominant hand. This ensures the blades do not snap shut when the locking nut is loosened.** Gently remove **the speculum whilst slowly closing the blades** *rotating them again for 90 degrees* (for the removing it through vulva in anterior-posterior diameter) and inspecting the walls of the vagina. Dispose **of the used equipment into a** clinical waste bin.

In case you suspect any infection or oncological pathology later vaginal or cervical swabs need to be done for the confirmation.

Continue by **vaginal examination.**

1. Be sure that her bladder is empty before the examination. A full bladder makes the abdomen difficult to palpate thoroughly and is uncomfortable for the woman.

2. Tell the woman, in terms she can understand, what you will be doing and share your findings through-out the examination using her name. *An informed woman is more relaxed. She is more likely to cooperate with you throughout the examination.* The woman has a right to know what is being done in regard to her body. This increases her comfort and relaxation.

3. Help her to lie down on the examining chair with legs bent so that her feet are resting on the table or in the stirrups. Place a pillow under her head and ask that she rest her hands across her abdomen or at her sides. Sometimes women put their hands over their heads during a vaginal examination, which tightens abdominal muscles and makes the examination more difficult or uncomfortable.

4. You may drape the woman's legs. Make sure that you can see her face whether you are providing the examination. Making sure that you can see her face at all times might reassure her and enables you to note expressions of fear, discomfort, or embarrassment. Tell the woman how to relax, recommend her do slow, deep, relaxed breathing at the time your examination.

5. Has the mother had any bleeding during the last part of her pregnancy? If you note any bleeding, do not proceed with the examination until you are sure that mother does not have *placenta previa*. Vaginal examinations are never performed if there is a question of a placenta previa.

6. Wash your hands and put on *sterile* gloves. This procedure describes a two-gloved approach.

7. One gloved hand is used to separate the labia (Fig. 4.18) and the other gloved hand conducts the vaginal/cervical examination. Generously lubricate the index and middle fingers of your examining hand with lubricating gel.

As you squeeze the tube, let the lubricant drop onto your outstretched fingers. Do not wipe your fingers against the mouth of the tube to obtain the lubricant. The lubricant should be considered clean only - not sterile. If it is uncertain whether the membranes have ruptured and a compelling reason exists for performing the examination, use only sterile water because some substances interfere with the Nitrazine papercolor change.

8. Be sure that you have a good lighting

9. Ask the woman if you may proceed now. Acknowledge the discomfort the examination may be causing her - even offer an apology. This appropriately gives the woman some control, is empowering, and is humanizing in a difficult situation. If the woman becomes upset or tense, or the uterine contraction comes during the examination, stop whatever you are doing. *(!)Do not remove your fingers; simply hold your hand still*. Wait until she has regained control, helping her to relax

10. Separate the labia with your gloved fingers (Fig. 4.18). One gloved hand is used to separate the labia by thumb and forefinger widely to expose the vaginal opening and prevent the another hand examining fingers from touching the labia.

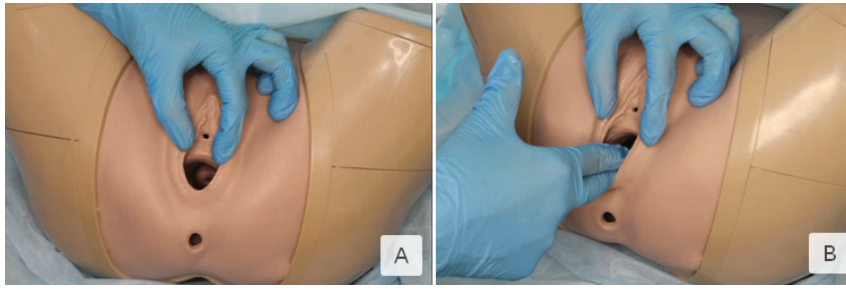


Figure 4.18. Start of the internal vaginal examination. A – separating the labia, B – inserting examining fingers.

11. Inspect the general area of the introitus (vaginal opening) according to the scheme in Table 4.4 below.

Table 4.4

Inspection of the vaginal opening

Look for the following:	Which it might indicate
Amount of *bloody show*	labor is advanced
Wet, glistening perineum	membranes have ruptured
Malodorous discharge	infection of the amniotic fluid and membranes is present
Deep yellow or greenish-brown discharge	fresh meconium or breech presentation
Ulceration of the labia Blisters or raised vesicles on the labia	specific genital infection: syphils (chancre) or an herpes simple virus (HPV) might be present, that may need specific antibiotic therapy
Mothers with herpes virus vesicles on the cervix or genitalia can pass the disease on to a newborn delivered vaginaly. Newborns delivered through an infected birth canal should be isolated to protect other newborns in the nursery. The mucus membranes (e.g., eyes, nasopharynx) of the newborn should be cultured at 24 48 hrs after birth to avoid positive cultures resulting from contamination from the mother.	

Turn your hand side and insert the first finger of the other (internal) hand and then the second finger gently into the vagina. Continue to apply *downward pressure* as you insert the fingers to avoid pressing on the anterior vaginal wall or urethra. Move your fingers the full length of the woman's vagina. Keep the thumb straight up and stretched out. Keep the fourth and fifth fingers bent inward and touching the palm of your hand (Fig. 4.19).

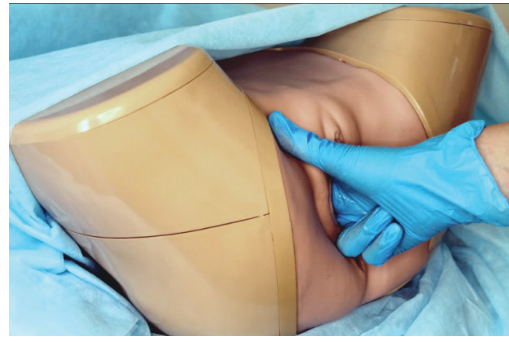


Figure 4.19. position of the examining hand during the vaginal examination. Thumb is straight up and stretched out, the fourth and fifth fingers bent inward and touching the palm.

Assessing Progress in Labor:

12. **Are the membranes ruptured?**

Palpate for a soft, movable, protruding sac through the cervix (Fig. 4.20). If the membranes are not ruptured, they tend to protrude especially during the uterine contraction. If they are ruptured, amniotic fluid is likely to leak during the examination.

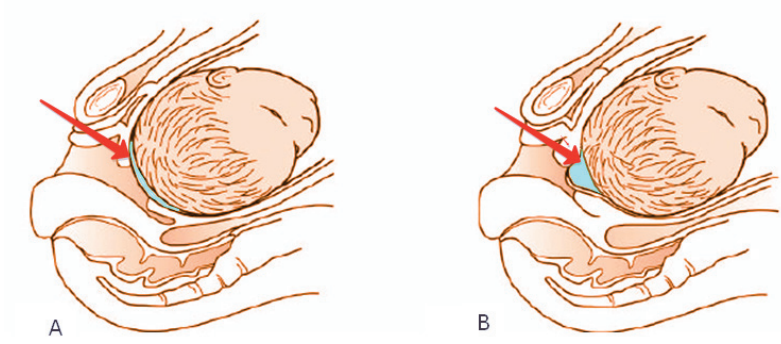


Figure 4.20. Fetal membranes. A. – watch glass shape, B – protruding (bulging) into the cervix.

13. **What are the cervical effacement and degree of dilatation?**

Effacement is *shortening and thinning* of the cervix during labor process and is measured in percentage in labor. Palpate the length and thickness of the cervix (Tab.4.5).

The normal cervical length at midpregnancy is approximately 40 mm and if it is shorter than 25 mm women suspected of cervical incompetency or at risk for preterm labor.

Table 4.5

Cervical length and effacement during the labor process

Length	3-4 cm	2 cm	1-1.5cm	0.5 cm	0 cm
Effacement	0%	<50%	50%	80%	100%

Dilatation is measured in centimeters. One finger represents *approximately 1-1.25cm dilatation.* Measurement of dilatation can be from 0 to 10 cm *in diameter* (Fig. 4.21).

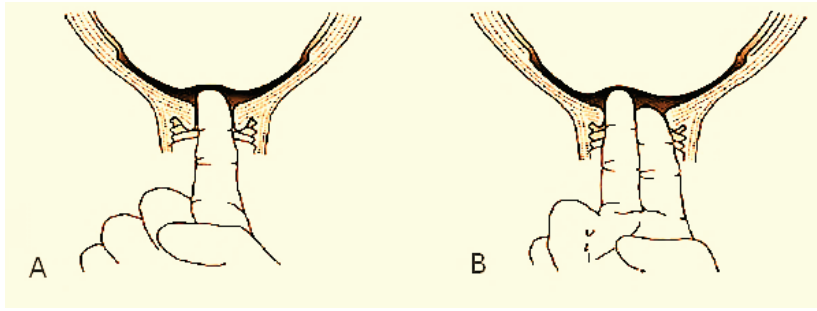


Figure 4.21. a) cervix is 80% effaced and 1 cm opened, b) cervix is 100% effaced and 2–3 cm opened.

14. **What is the presenting part of the fetus?**

Palpate for the presenting part. In cephalic (occiput, vertex) presentation you feel *hard* smooth skull with the sagittal suture. Follow it to the posterior or anterior fontanelle, to identify position (Fig. 4.22).

In face presentation you will feel irregular, knobby parts like facial features, with a mouth, follow the side to find fetal chin and identify position.

In breech presentation you will feel *softer* not smooth (irregular shape) buttocks. You may identify fetal feet and umbilical cord loop (pulsating) – for *footling* or a *complete breech presentation* or an *umbilical cord prolapsed*. In breech presentation you may identify position by the localization of the fetal sacrum.

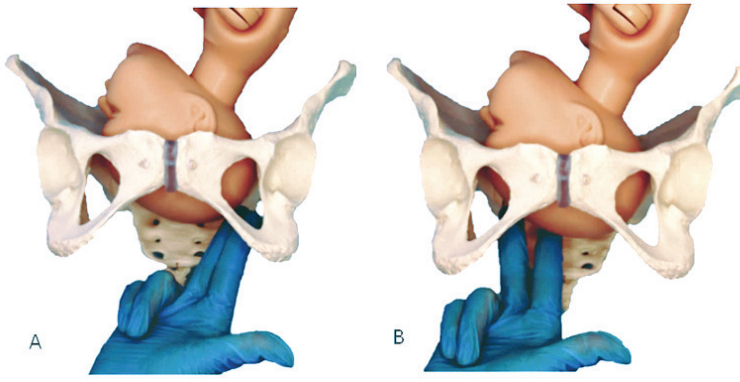


Figure 4.22. Identification of fetal fontanelles A. Palpation of the posterior fontanelle. B. Palpation of the anterior fontanelle.

15. **What is the station? Has engagement occurred?**

For the determining of the ***station*** locate the *lowest portion* of the presenting part and then sweep the fingers deeply to one side of the pelvis to feel for the ***ischial spines*** (Fig. 4.23).

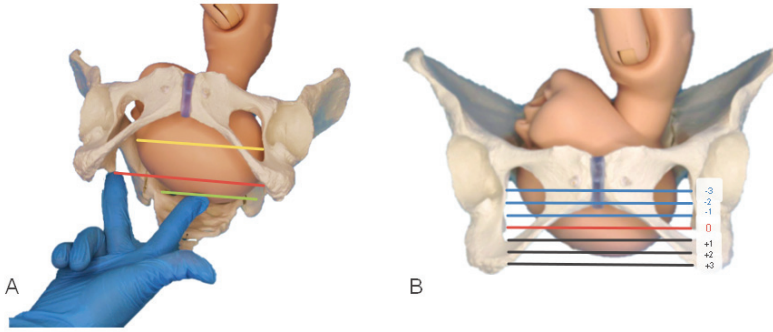


Figure 4.23. Examination for fetal station. A. Red line – interspinal, green line – top of the fetal head +1 cm (approximately 1-2 cm below the ischial spines), yellow line – widest part of the fetal head, just above the ischial spines - station 0+1. B. Fetal station levels, here station +2.

Imagine a straight line from one spine to the other (red line) and estimate *how far (in centimeters) the tip of the presenting part (**scull but not scalp**!) is above or below the ischial spine* (green line). Station is +5 to -5 scale. Station provides some information about the descent of the fetus through the pelvis. If the station is below the interspinal diameter that will be +1or more, the pelvis is probably adequate for labor.

Engagement occurs when the *widest part* of the fetal head (yellow line) has passed the inlet and reached the widest plane of the pelvis - cavity. Commonly, this occurs when the tip of the presenting part has reached the level of the ischial spines (i.e, station 0).

A vaginal examination needs to begin between contractions and ideally should be continued throughout a contraction in the laboring woman. Examination between contractions tells you about the degree of dilatation and effacement, specificities of the presenting part, leakage of the amniotic fluid. Examination during a contraction tells you the full extent of dilatation, effacement, bulging of the membranes and descent of the presenting part. It provides you with a clearer picture of how the laboring woman is doing.

16. Remove your fingers and discard gloves.

Tell the woman your findings and relate them to her progress in labor. Praise the woman for whatever you can at that point (for example, working with you during the examination, achieving progress in labor to whatever degree, or seeking medical attention). *It has proven that information is able to calm and support a woman. Find some words of empowerment from the examination!*

Summarise your findings

Example summary

"Today I examined Mrs Smith, a 28-year-old female who is currently at 38 weeks gestation. Valvular and speculum examination were with no evidence of any pathology. Membranes are safe.

*On vaginal examination, bony pelvis seems to be adequate for the labor, uterine cervix is 80% effaced and 4 cm opened. Membranes are bulging during the contraction. Fetal presentation is cephalic, with 0 molding, posterior fontanelle seems to be anterior and left (identification of the position **not** informative with safe membranes), not engaged.*

Finally, I can confirm that patient is in a true labor- latent phase of the first stage and these findings are consistent with a normal obstetric abdominal examination in a laboring woman. Hospitalization to the labor department is needed and routine labor care is indicated."

Review questions

1. List most important preparations you need to elicit before starting physical examination of a woman being admitted to the labor unit.

a. _____
b. _____
c. _____
d. _____
e. _____

2. What is the reason for a patient's side-lying or upright siting position during examination?

a. _____

3. What are included in a general appearance examination?

a. _____

b. _____

c. _____

4. Patinen's BP more than _____mm Hg is considered mild hypertension and higher than _____ mm Hg - severe hypertension.

5. By what Leopold's maneuver the fetal lie is discovered?

a. first

b. second

c. third

d. fourth

6. What picture below is showing Pinard stethoscope?

A

B

7. In laboring woman the functions of a vaginal examination are to:

a. _____

b. _____

c. _____

d. _____

e. _____

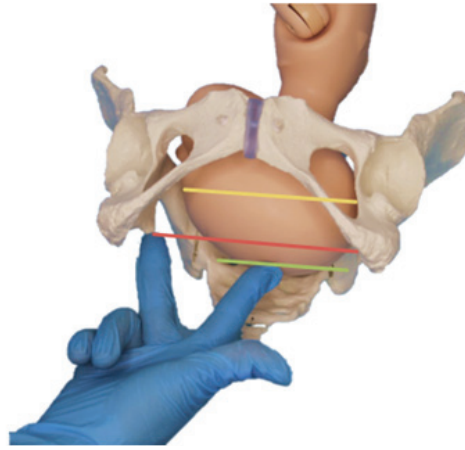
f. _____

g. _____

8. What are the cervical effacement and degree of dilatation? complete the chart below

Length (cm)					
Effacement	0%	<50%	50%	80%	100%

9. In the picture below what do the different color lines mean?



Red _____
Yellow _____
Blue _____

10. What tells you additionally the vaginal examination during a contraction?

a. _____
b. _____
c. _____

REVIEW ANSWER KEY

1. introducing yourself, confirmation of a patient's name, explanation of the procedure, urine passage before exam, proper positioning of the patient

2. avoiding the risk of the vena cava syndrome
3. facial expression, skin, odor
4. 140/90, 160/110
5. b
6. b
7. Confirm if true labor has begun, membrane rupture and the color of the amniotic fluid, size of the mother's pelvis, fetal presentation and position, molding of the fetal skull bones, the progress of labor
8. 3-4 cm, 2 cm, 1-1.5cm, 0.5 cm, 0 cm
9. red line – interspinal diameter,
blue line – the top of the fetal head
yellow line – widest part of the fetal head
10. a) the full extent of dilatation and effacement, b) bulging of the membranes and c) descent of the presenting part

Practical part

During the practical class you need to show in phantoms speculum examination and manual vaginal examination of a laboring woman according to a following check list

The check list example

Date		Student's name	
speculum examination and manual vaginal examination of a laboring woman		Task number	

N	Tasks	Ratings		
		0	**1**	**2**
1	**ID** Introduce yourself to the patient including your name and role Confirm the patient's name and date of birth			
2.	**Information and permission** Briefly explain what the examination will involve using patient friendly language Consider the need for a **chaperone**			

3.	Have the patient **empty their bladder**			
4.	**Explain the procedure** **Prepare your tools** for examination ahead of time • All tools should be available and prepared prior to positioning the patient • Lubricant if required • Make sure the overhead light is working. • Rationale: This prevents prolonged exposure of the patient and minimizes personal discomfort for most people.			
5.	**Ask patient to undress and position** them for abdominal exam • Provide for maximum privacy • Position the patient on the clinical examination couch with the head of the bed at a 30-45° angle for the initial assessment, on the examination table with knees bent, knees apart and heels together or help put feet in stirrups (as per patient preference) • Have them move close to the end of the table that you will be sitting at for the exam. Rationale: This provides a position of access that is both easy to visualize and easy to access with the speculum. Drape the patient to provide as much privacy as possible			
6.	**Provide general examination** Signs of distress, facial expression, state of awareness Skin color Personal hygiene, Odor Vital signs Blood pressure Pulse Respirations Temperature			
7.	**Provide external obstetric examination** Fundal height measurement Abdominal circumference assess the frequency and duration of contractions perform palpation by Leopold's maneuvers asses fetal heart tones using a Pinard stethoscope			
8.	Summarise your findings for the first part			
9.	**Explain the need for internal vaginal examination** and get patient's concern			

10.	**Wash your hands**			
11.	**Prepare the speculum** Run the speculum under warm tap water and test for comfort by touching the speculum to the inside of the client's thigh. Ensure all parts of the speculum are functioning including the screw or clip that will hold it open once the cervix is visualized.			
12.	**Insert the speculum into vagina**			
13.	**Inspect the cervix**: Assess for any abnormalities that may require further testing (Discharge, Redness, Lesions, Ulcers, Growths)			
14.	**Remove the speculum** Once removed, place the speculum in the appropriate container for disposal (if one time use) or for cleaning (if multi- use)			
15.	**Prepare the patient for a manual exam** Explain the procedure to the patient Assess for need to change gloves and rinse gloved hand under water and/or add lubrication			
16.	Separate the labia with your gloved fingers. Inspect the **general area of the introitus**.			
17.	Insert 1 or 2 fingers from dominant hand (usually index and middle finger) into vagina with palm facing the inner thigh, then rotate hand so that palm is facing upwards. Locate **cervix** and assess: cervical effacement and degree of dilatation rupture of the membranes presenting part of the fetus station and engagement			
18.	**Inform patient** that the examination is complete Remove gloves, re-drape patient, wash hands, inform the patient you will return to summarize and allow patient time to dress			
19.	**Summarize** Inform patient of findings, include plan for any further testing and next follow up appointment. Include the patient in decisions. Ensure client understanding through talk back approach.			
20.	Total score Rating "3" – 26-29 Rating "4" – 30-33 Rating "5" – 34-38			

MODULE 3. INTRAPARTUM CARE

Practical class 5. Managing an Unexpected or Precipitous Birth

When you will finish the class, you will be able to

1. define the signs of an impending birth
2. recognize situations that can result in an unexpected or precipitous birth before the obstetric provider arrives
4. gather the equipment for emergency birth
5. deliver the baby, support natural birth, and help the newborn adapt to extrauterine life

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Brief explanation or definition of the term
False labor	Ложные схватки	
Emergency birth pack	Укладка на роды	
External rotation	Наружный поворот	
Crowning	Прорезывание головки	
«Somersault» maneuver	Прием сальто	
Colostrum	Молозиво	
Turtle sign	Симптом черепахи	
Shoulder dystocia	Дистоция плечиков	
Meconium aspiration syndrome	Синдром мекониальной аспирации	

☛ **Which women are at risk for precipitous (too fast) or unexpected delivery?**

- Have preterm labor (smaller baby)
- Have a history of a rapid labor or a previous precipitous birth
- Have had at least one vaginal birth
- Are in active labor and have travelled a great distance to the hospital
- Have an unexpectedly small baby

☛ **Determining True Labor**

You need to be aware that labor may start at any time. This is one of its 'indefinite' features, so you should always be ready to take appropriate action. Despite much advancement of maternal and fetal health sciences, so far *nobody knows exactly when is labor going to start.*

A ***normal labor*** has the following characteristics:

1. Term pregnancy (gestational age is from 37w 0d to 41w6d)
2. Spontaneous onset (it begins on its own, without medical intervention)
3. Rhythmic and regular uterine contractions
4. Vertex or occipital presentation
5. No maternal or fetal complications.

Any type of labor that deviates from these conditions is considered abnormal, and usually requires referral for specialist care

As the process of labor onset is complex, it is usually preceded by a preparatory period two weeks ahead characterized by irregular contractions which are less painful than in true labor and they don't progress. This condition is termed ***false labor***.

It is very important to distinguish false labor from true labor contractions because in false labor the woman's body *is not completely ready for the birth process* and *with an* ***erroneous diagnosis*** *unnecessary medications, obstetric manipulations and even operative delivery is often used that significantly increase the risk of birth traumas and postpartum infections in both mother and her child.*

Table 5.1

Characteristics of a true and false labor

Characteristics	False labor	True labor
Uterine contractions	Contractions occur at irregular **intervals**	Contractions occur at regular intervals, but the interval between each contraction gradually becomes shorter
	Duration remains unchanged either long or short	Duration of each contraction gradually increases
	Intensity remains unchanged	Intensity of contractions becomes stronger and stronger
Cervical dilation	**Cervix** does not dilate, remains less than 4 cm	Cervix progressively dilates
Pain	Discomfort or pains usually relieved by strong antipain medication or by walking	Discomfort or pains at the back in the abdomen, cannot be stopped by strong anti-pain medication

When a woman has a false labor, she should not be discouraged. Tell her that although she is not yet in true labour, the signs she is experiencing mean that her labour will start soon. *Instruct her to return if any of the following occur*:

- Membranes rupture, even without contractions
- Contractions become more frequent
- Excessive bleeding
- Headache, visual complaints, epigastric pain
- Decrease fetal movement

***True labor** is characterized by regular, rhythmic, and strong uterine contractions that will increase progressively and lead to the cervical effacement and opening.*

Pain symptoms may be relieved a little if the woman takes painkilling drugs, but true labor will still progress

☛ Signs and Symptoms of an Impending Delivery

• A woman having her second or subsequent baby who exclaims, "It's coming!" is probably correct. When the baby's head crowns woman experiences the maximal perineal stretch, or "ring of fire"

• Woman may hold her breath or grunt during contractions

• She may starts to sweat

• Involuntary shaking of the legs in a woman having an unmedicated birth (no epidural) may occur as the presenting part descends, putting pressure on nerves.

• Increased bloody show may be seen as the cervix completes dilation.

• A strong urge to "push" or to bear down (rectal pressure), or actual involuntary pushing with contractions may occur ("Ferguson's reflex").

• Separation or parting of the labia may be seen as the presenting part emerges.

• Each contraction (and each push from the mother) moves the baby further down. Between contractions, the mother's uterus relaxes and pulls the baby back up a little (but not as far as it was before the contraction) (Fig. 5.1).

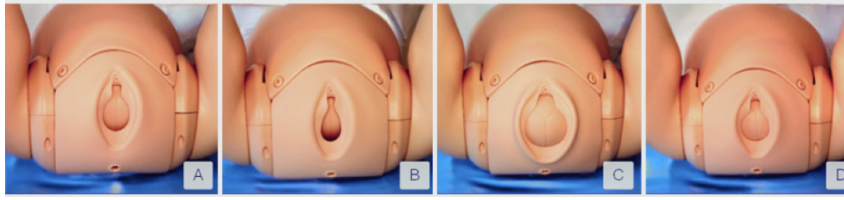


Figure 5.1. Labial separation. A. During a contraction, the baby's head shows. B. Between contractions the baby's head goes back inside the vagina. C. A little more of the baby's head shows with each next contraction and pushing effort. D. Between following contractions, the head slips back but not as far as before.

• After a while, you can see a little of the baby's head coming down the vagina during contractions. The baby moves like an ocean tide: in and out, in and out, but each time closer to birth. Relaxation and bulging of the anus, with or without loss of stool, may also be seen.

When the baby's head stretches the vaginal opening to about the size of the palm of your hand (Figure 5.2), the head will stay at the opening

– even between contractions. This is called ***crowning***. Once the head is born, the rest of the body usually slips out easily with one or two pushes.

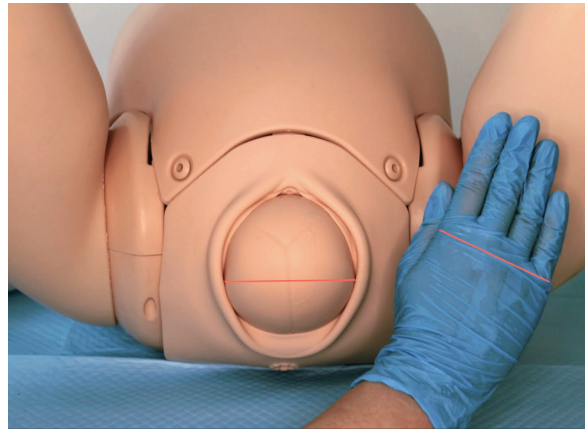


Figure 5.2. The fetal head stretches the vaginal opening to the size of the palm of your hand.

☛ **What must you do to assist with the birth for consistency?**

1. Relax and stay calm. Introduce yourself. Help the mother and her support person prepare for the imminent birth. Remember, women have been birthing for centuries and birth is a natural process. It will happen whether or not you are in the room.

2. Calmly call for assistance. Have another person in the room to help with the care of the mother and newborn. *Do not leave the room*. Send her support person for help if necessary.

3. Position the mother comfortably to her, but so that the perineum, to which you must have access, can easily be viewed (Fig. 5.3). Note that it is not good for the mother to lie flat on her back during a normal birth. Lying flat can lead to the *inferior vena cava compression syndrome* (supine hypotensive syndrome) and diminish the circulation in mother, increase fetal hypoxia and can make the birth slower.

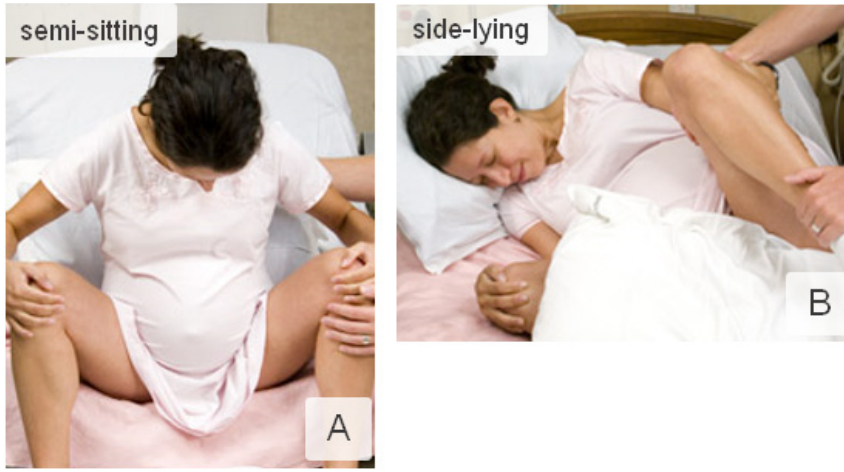


Figure 5.3. Different positions during the birth process. A. Semi-sitting position may be the most comfortable and makes it easier for the birth attendant to guide the birth of the baby's head. B. Side-lying position is relaxing and helps prevent tears to the vagina or perineum.

4. It is not necessary to scrub the perineum with an antiseptic, this wastes time. Do wipe away stool with sponge. Wipe excess secretions away also.

5. If chart information is not available, **obtain patient information** with a 30-second history:

• Which baby is this for you? (*nulliparous women are unlikely to deliver baby fast*)

• When is your due date? (*preterm baby is usually smaller and delivery may be faster, also preterm baby is at increased risk for resuscitation need*)

• Did you have prenatal care? (*women without history of a prenatal care are at higher risk for possible complications*)

• Have you had any problems with the pregnancy? (*if she report about certain problem you can be better prepared to possible complications, use prophylactic measures if possible, inform about her problem when you will report to her obstetric provider*)

• Do you have any health problems? (*same – if she has any medical condition it may complicate during labor or in a postdelivery period*)

6. If possible **open the emergency birth pack** in the near of the patient. It should contain at least the following items (Fig. 5.4):

- A package of (+/- x-ray detectable) sponges
- Absorbent towels
- Two clamps, such as Kelly or Rochester (use only if necessary)
- A cord clamp or umbilical tape
- Scissors
- Baby blankets
- Gloves

Figure 5.4. Equipment needed for attending a normal birth

7. Birth is a clean, not a sterile event. **Put on gloves**, but do not waste time finding the correct size sterile gloves if they are not readily available. If possible, provide careful handwashing, done sterile gloves, and use the sterile emergency birth pack because it will help reduce the possibility of infection.

8. Place the **clean barrier** under the woman's hips. Use a piece of cloth or gauze to cover the mother's anus; some faeces (stool) may be pushed out with the baby's head. Prepare for birth of the baby. *Do not take your eyes off the perineum*. What will you see and it corresponds to the birth process is shown on Figure 5.5 below

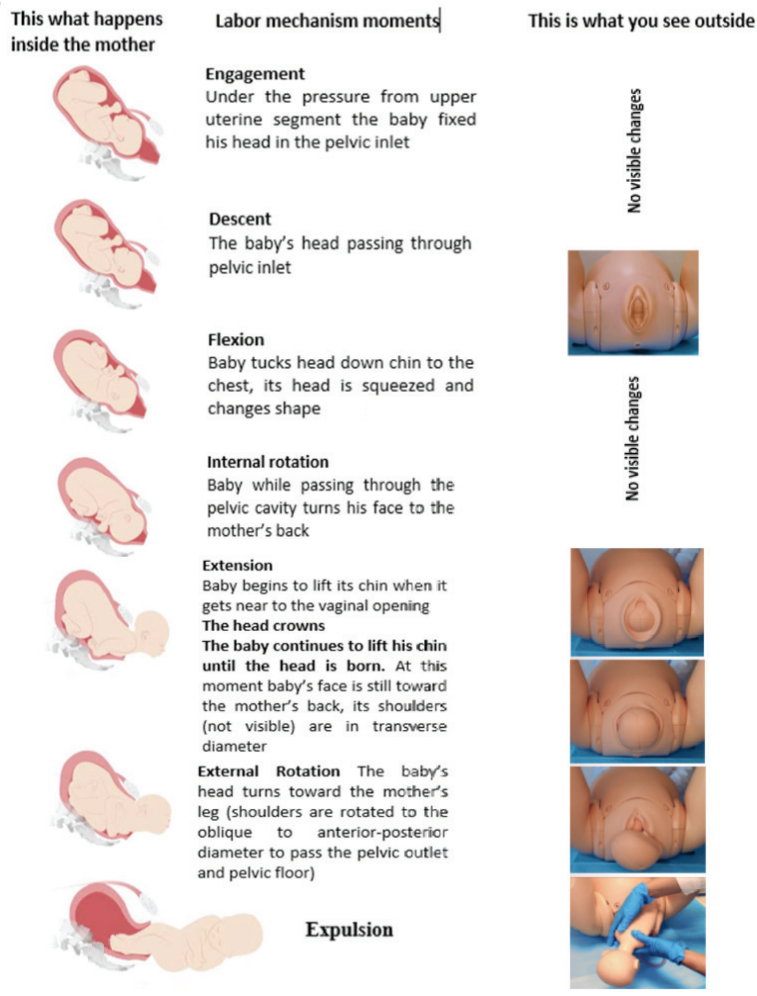


Figure 5.5. The seven cardinal movements of the baby during labor and delivery.

No visible changes

9. Instruct the woman to "feather blow" (breathe with open mouth) with each contraction, unless you told her to push.

When a woman pushes, she uses abdominal muscles and increases intra-abdominal pressure. This enhances the expulsive action of the contracting uterus and potentially increasing risk for trauma of maternal tissue and the

baby at the moment of fetal head is ready to fix and rotate under pubic arch. "Feather blowing" helps the woman to control the urge to push.

10. Control of the fetal head descend is important

Research has shown the "hands-on" (Figure 5.6) or "hands-off" (allowing the head to birth on its own) approach to delivery of the head results in the same number of perineal lacerations. But ***never pulling on the baby's head***!

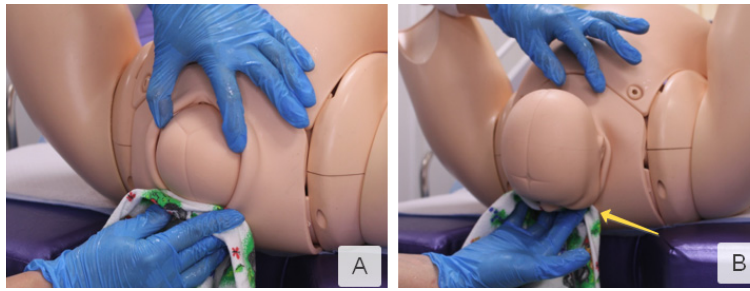


Figure 5.6. "*Hands-on*" approach to delivery of the head. A. Maintaining flexion of the fetal head with one hand by gently pushing downward B. Removing the perineum over the baby's face by lower hand (yellow arrow shows you baby's chin to be manually free from perineum skin)

• Allow slow, controlled extension of the head. *Once the head has crowned*, ***ask woman to stop pushing*** by breathing with open mouth, now the head is born by the extension of the face, which appears at the perineum.

The moment of extension is the riskiest for perineum tears, so removing the pushing effort you make it slower and potentially less traumatic.

• With your other hand, gently ***ease the perineum over the baby's face*** (Figure 4b)

• When the head is born, and before the rest of the body comes out, you may need to help the baby breathe by ***clearing its mouth and nose***. If the baby has some mucus or water in its nose or mouth, wipe it gently with a clean cloth wrapped around your finger.

11. Check for a nuchal cord by slipping one finger down the baby's neck as the head emerges

• If possible, gently slide the cord over baby's head (Figure 5.7)

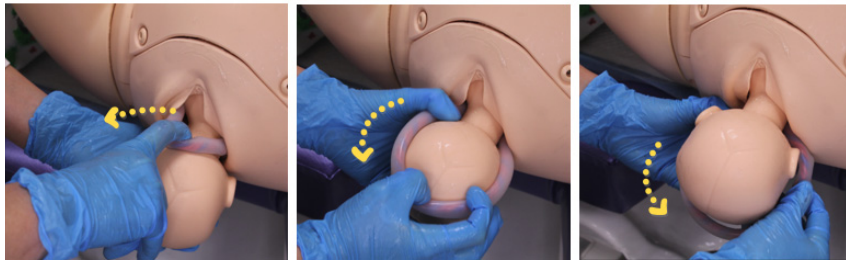


Figure 5.7. Steps of the sliding the cord over baby's head.

• If the cord is very tight, or if it is wrapped around the neck more than once, try to provide Somersault maneuver (Figure 5.8).

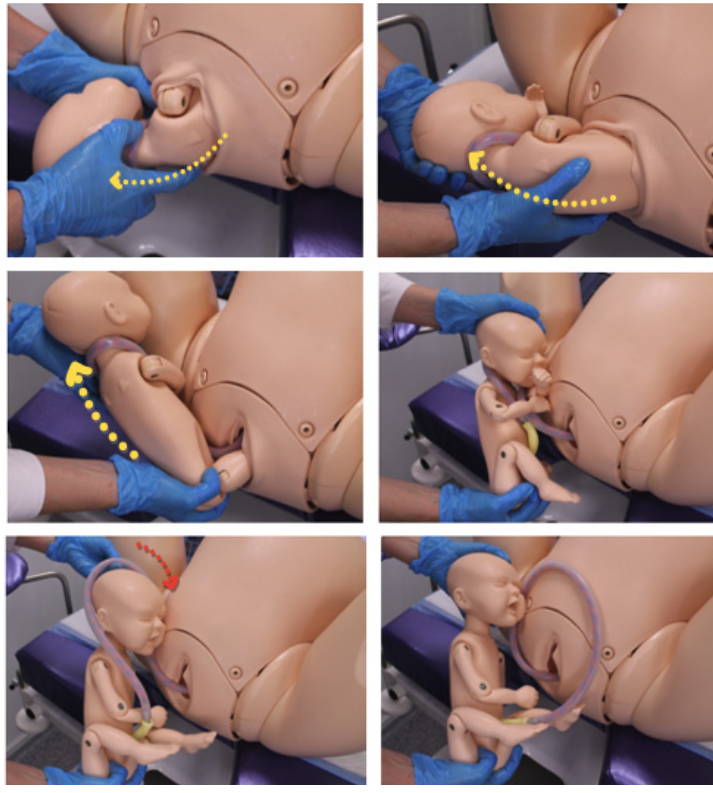


Figure 5.8. Steps of the "Somersault" maneuver for a tight umbilical cord.

• If you cannot loosen the cord, and if the cord is preventing the baby from coming out, you may have to clamp and cut it.

If you can, use medical clamps and blunt-tipped scissors for clamping and cutting the cord in this situation. If you do not have them, use clean string and a new razor. Clamp or tie in two places and cut in between (Fig. 5.9). Be very careful not to cut the mother or the baby's neck.

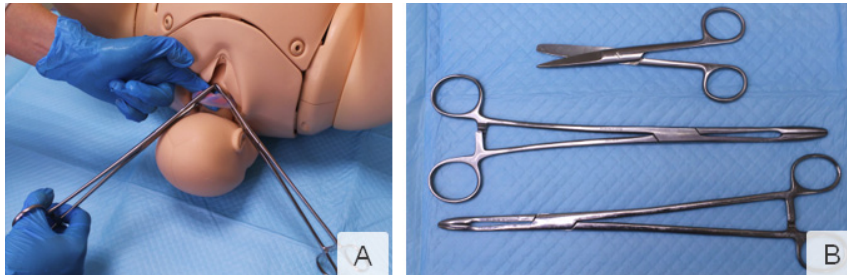


Figure 5.9. Cutting of a very tight umbilical cord. A. Putting clamps on the cord. B. Instruments to be used.

If you cut the cord before the birth of the baby, the mother must push hard and get the baby out fast. Without the cord, the baby cannot get any oxygen until he or she begins to breathe.

12. Wait for a **spontaneous external rotation** of the fetal head. It may last till 60 sec. *As the rotation occurs because of specificity of the uterine contraction and pushing may hurt this, repeat your request to the mother not to push and breathe with open mouth.*

13. After the baby's head is born and he or she *turns face to the mother's leg*, wait for the next contraction. **Ask the mother to give a gentle push** as soon as she feels the contraction.

*14. If spontaneous rotation of the fetal head does not occur within 60 sec and the fetal head retracts back against the perineum and does not attempt to externally rotate ("**turtle sign**", the shoulders are "stuck" the **shoulder dystocia** has happened* (see the next practical class)

Support delivery of the upper part of anterior shoulder in a downward fashion and then the posterior shoulder in an upward fashion Figure 5.10.

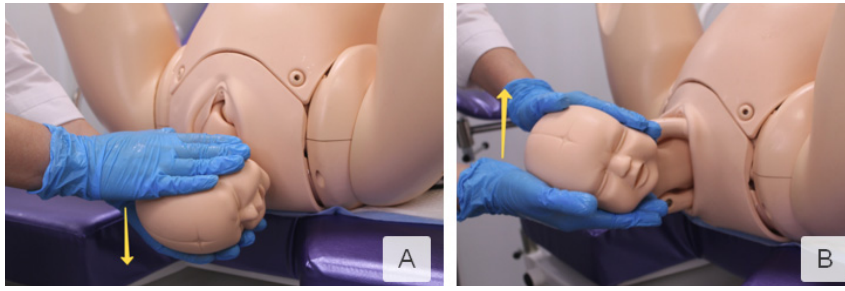


Figure 5.10. Delivery of the shoulders.

15. Support birth of the body by expulsion. (Figure 5.11). After the shoulders are born, the rest of the body usually slides out without any trouble. Remember that new babies are wet and slippery. Be careful not to drop the baby!

Figure 5.11. Supporting birth of the fetal body. To avoid fetal head overextension and potential spinal trauma fix its neck or just try keep him face down.

16. Place baby skin to skin on mother's chest or abdomen and allow the cord to stop pulsating. (Figure 5.12).

Figure 5.12. Placing baby skin to skin on mother's abdomen.

17. ! Prevent loss of body heat by drying the baby, then covering both mother and baby with warm blankets. This should be sufficient stimulation to assist with spontaneous respirations.

Figure 5.13. Covering baby with warm blankets and drying him is usually sufficient stimulation to assist with spontaneous respirations.

18. Allow the **umbilical cord** to stop pulsating before clamping and cutting. This will receive extra blood to the baby. Use a sterile string or sterile clamp to tightly tie or clamp the cord about two finger widths from the baby's belly. Tie a square knot (Figure 5.14). Put another sterile string or clamp one finger from the first knot. And, if you do not have a clamp on the cord on the mother's side, add a third knot two fingers from the second knot. Putting a double knot on the cord reduces the risk of bleeding.

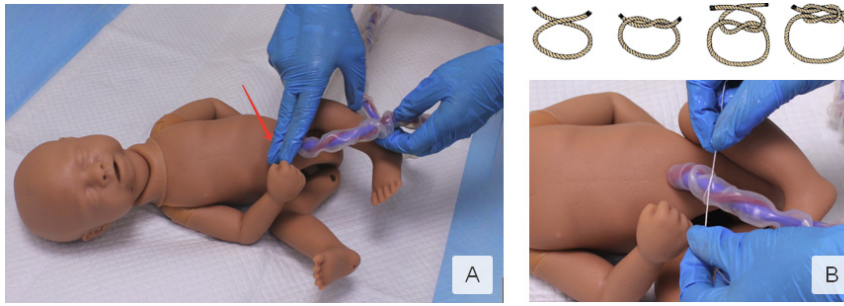


Figure 5.14. Cutting the umbilical cord. A. Two finger widths from the baby's belly. B. Tying a square knot.

19. Cut after the second tie (e.g. the first tie is approximately 3 cm from the baby's abdomen and the second is approximately 5 cm). Cut after the 5 cm tie with a sterile razor blade or sterile scissors.

20. Cleaning. Principles of cleanliness are essential in both home and health post childbirth to prevent infection to the mother and baby.

Clean your hands, mother's perineum, delivery surface.

Nothing unclean introduced vaginally.

The stump of the umbilical cord must be kept clean and dry to prevent infection. Wash it with soap and clean water only if it is soiled. Do not apply dressings or substances of any kind It usually falls off 4-7 days after birth, but until this happens, place the cord to prevent contamination with urine/faeces. If the cord bleeds, re-tie it.

21. Check the newborn. Most babies are alert and strong when they are born. Other babies start slow, but as the first few minutes pass, they breathe and move better, get stronger, and become less blue. Immediately after delivery, clear airways and stimulate the baby while drying. To see how healthy the baby is, watch for:

• *Breathing*: babies should start to breathe normally within seconds after birth. Babies who cry after birth are usually breathing well. But many babies breathe well and do not cry at all.

• *Color*: the baby's skin should be a normal color – not pale or bluish.

• *Muscle tone*: the baby should move his or her arms and legs vigorously.

All of these things should be checked simultaneously within the first minute after birth. You will learn about this in detail in Neonatology classes.

22. Warmth and bonding. Newborn babies are at increased risk of getting extremely cold. *The mother and the baby should be kept skin-to-skin contact, covered with a clean, dry blanket.* This should be done immediately after the birth, even before you cut the cord.

The mother's body will keep the baby warm, and the smell of the mother's milk will encourage him or her to suck. Be gentle with a new baby. The first hour is the best time for the mother and baby to be together, and they should not be separated.

This time together will also help to start breastfeeding as early as possible.

23. Early breastfeeding. If everything is normal after the birth, the mother should breastfeed her baby right away. She may need some help getting started. The first milk to come from the breast is yellowish and is called ***colostrum***. Some women think that colostrum is bad for the baby and do not breastfeed in the first day after the birth. But colostrum is very important! It is full of protein and helps to protect the baby from infections.

! Breastfeeding makes the uterus contract. This helps the placenta come out, and it may help prevent heavy bleeding.

! Breastfeeding helps the baby to clear fluid from his nose and mouth and breathe more easily.

! Breastfeeding is a good way for the mother and baby to begin to know each other.

! Breastfeeding comforts the baby.

! Breastfeeding can help the mother relax and feel good about her new baby.

If the baby does not seem able to breastfeed, see if it has a lot of mucus in his or her nose. To help the mucus drain, lay the baby across the

mother's chest with its head lower than its body. Stroke the baby's back from the waist up to the shoulders. After draining the mucus, help the mother to put the baby to the breast again.

note that you will learn about resuscitation of the newborn who is not breathing adequately in neonatology classes

Review questions

1. **Which of the following situations could result in delivery of the baby before the arrival of the obstetric provider?**

a. An unexpectedly small baby
b. Rapid progress during labor
c. Grand multiparous
d. History of rapid labors

2. List equipment that should be available in the sterile emergency birth pack.

_____
_____
_____

3. "Feather blowing" may help the laboring woman control the urge to push.

a. True
b. False

4. A baby born with meconium-stained fluid requires vigorous suctioning to prevent meconium aspiration syndrome.

a. True
b. False

5. If the baby's head is delivering too fast, the nurse should hold it back.

a. True
b. False

6. List at least six actions you should do once the baby is delivered to ensure its safety.

a. _____
b. _____

c. _____
d. _____
e. _____
f. _____

7. Which of the following statements is false? In each case, explain what is incorrect.

1. Full dilatation of the cervix to 10 cm is the most important sign that the second stage of labor is beginning.

2. In second stage, the mother's genitals tend to bulge during contractions and relax between contractions.

3. Crowning is the name given to the moment when the baby's head is completely born.

4. In a normal delivery, the baby moves down the birth canal facing the front of the mother's body, with its back towards her backbone.

5. While it is still in the birth canal, the baby's heartbeat tends to get faster during a contraction.

6. Let the mother choose the position that she feels most comfortable in when she gets the urge to push in the second stage of labor.

8. Maintaining the supine position for a long time sometimes results in _____

9. On the picture below what direction of movement is prohibited _____ (green or red)

10. Rearrange the following actions into the correct order during delivery ofthe baby and immediately afterwards.

A. Once the baby's head is born, help it to breathe by clearing its nose and mouth.

B. Wash your hands well and put on sterile gloves and other protective clothing.

C. To prevent tearing of the mother's birth vagina or perineum, deliver the baby's shoulders one at a time.

D. Press one hand firmly over the mother's perineum.

E. When the baby has been completely delivered, put it on the mother's abdomen and dry it with a clean cloth.

F. Clean the mother's perineal area with antiseptic.

G. Clamp or tie the cord in two places and cut it in between the clamps.

H. Use your other hand to apply gentle downward pressure on the top of the baby's head to keep it flexed (bent downwards).

I. Cover the baby to keep it warm and give it a chance to breastfeed straight away.

J. Use a piece of cloth or gauze to cover the mother's anus in case any faeces come out with the baby.

K. Check that the cord is not around the baby's neck

REVIEW ANSWER KEY

1. a, b, c, d

2. gauze sponges, two absorbent towels, small sterile drape, two clamps,

scissors, baby blanket, gloves, +/- soft bulb syringe

3. True

4. False

5. False

6. any of the following:

a. Do not hold the head back

b. Inspect the baby's neck for a nuchal cord

c. Place the baby on the maternal abdomen/chest

d. Check the airway and wipe away excess secretions if the baby is having trouble establishing respirations

e. Dry the baby

f. Allow the umbilical cord to stop pulsating

g. Prevent heat loss by covering mother and baby

7.

1) true. Full dilatation of the cervix to 10 cm is the most important sign that second stage of labor is beginning.

2) true. In second stage, the mother's genitals tend to bulge during contractions and relax between contractions.

3) false. Crowning is when the top of the baby's head stretches the vaginal opening to the size of your hand and it stays in the opening even between contractions.

4) false. In a normal delivery, the baby moves down the birth canal facing the back of the mother's body, with its own back towards her belly.

5) false. While it is still in the birth canal, the baby's heartbeat tends to get slower (not faster) during a contraction.

6) true. You should let the mother choose the position that she feels most comfortable in when she gets the urge to push in the second stage of labor

8. vena cava syndrome (supine hypotension)

9. red is prohibited. Pulling is very dangerous for the fetal cervical spine severe trauma

10. The correct sequence is as follows: B-F-D-J-H-A-C-E-I-G

Practical part

During the practical class you need to show in phantoms management of an unexpected or precipitous birth according to a following check list:

Example of the task

"You arrive a scene where a young woman with term singleton pregnancy is complaining of heavy and frequent contractions, last two minutes she had urge to push. You need to manage the late second stage of labor. Comment all your manipulations"

The check list example

Date		Student's name	
Second labor stage		Task number	

N	Tasks	Ratings		
		0	**1**	**2**
1.	Introduce yourself to the patient including your name and role Confirm the patient's name Call for assistance			
2.	Assist the woman into a position of her choice, as upright as possible and ensure her comfort in this position			
3.	Explain to the patient need for obstetric examination. Seek permission and discuss findings with the woman			
4.	Ask for antiseptic and sterile gloves, clear blankets, scissors, and smth that can be used as ligatures or an emergency birth pack wash hands wear sterile gloves			
5.	Support the woman to push as she wishes with contractions and explain the woman how to "feather blow" and how to push			
6.	After the head crowning (appearance of the parietal tubercles), ask the woman not to push (to "feather blow")			
7.	As soon as head delivered inspect for the nuchal cord, if the cord is around the neck but it is loose, slip it over the baby's head If the cord is tight, try to slip the cord over baby's shoulders (for a «Somersault» maneuver) If the tight cord prevents birth of the body, place 2 clamps on the cord approximately 2-3cm apart and cut between the clamps, quickly unwrap the cord around the neck			
8.	Wipe the head and face dry, only for excessive secretions use bulb syringe to suction the mucus from the nose and mouth			

9.	Repeat your request to mother not to push and allow the baby's head to rotate spontaneously, wait for shoulders to rotate into oblique (or anterior-posterior diameter)			
10.	Stand on the side of the fetal back and put one hand palm-side up below the fetal head. With next contraction and ask mother to give a gentle push Place other hand on the upper fetal head side and with downward traction on the head, deliver the anterior shoulder			
11.	As soon as anterior shoulder delivers, provide upward and outward tractions for the posterior shoulder delivery			
12.	Support the delivery of the rest of the baby's body and place the baby on the mother's chest or abdomen for the skin-to-skin contact			
13.	Note the time of birth, cover baby with the blankets			
14.	Thoroughly dry the baby and wipe the eyes. Remove the wet cloth, cover the baby's head and body with a clear blanket			
15.	Allow the cord pulsating by its own, place 2 clamps on the cord approximately 2-3cm apart and cut between the clamps			
16.	Check the newborn for breathing color and muscle tone			
17.	Encourage early breastfeeding			
18.	Clean mother's perineum, delivery surface			
19.	Wash your hands, remove gloves			
20.	Congratulate the patient, prepare for the third labor stage			
21.	Total score Rating "3" – 28-31 Rating "4" – 32-35 Rating "5" – 36-40			

Practical class 6. Managing physiological and pathological third labor stage and early postdelivery

When you will finish the class, you will be able to

1. define clinical appearance of the third labor stage
2. estimate signs of the placental separation
3. provide third labor stage active management
4. perform controlled cord traction with counter pressure
5. check the placenta for completeness
6. provide most common postdelivery complication management

Key Terms

Before you start this module, please write out the meaning of the following terms mentioned in this module:

Term	Russian	Brief explanation or definition of the term
Postpartum haemorrhage (PPH)	*Послеродовое кровотечение*	
Active management of third stage of labor (AMTSL)	*Активное ведение третьего периода родов*	
Separation of the placenta	*Отделениме плаценты*	
Uterine spiral arteries	*Маточные спиральные артерии*	
Remodeling of spiral arteries	*Ремоделирование спиральных артерий*	
Myometrium	*Миометрий*	
Retroplacental hematoma	*Ретроплацентарная гематома*	
Expulsion of the placenta	*Выделение (рождение) последа*	
Hemostasis	*Гемостаз*	
Retained placenta	*Задержка последа*	

Placenta accreta	*Приращение последа*	
Placenta increta, percreta	*Истинное врастание последа*	
Uterine inversion	*Выворот матки*	
Uterotonic drugs	*Утеротоники*	
Controlled cord traction	*Контролируемые тракции за пуповину*	
Volume replacement	*Восполнение объема*	
Sponge forceps	*Окончатые щипцы*	
Endometritis	*Эндометрит*	
Uterine atony	*Атония матки*	
Coagulation disorders	*Нарушения свертывания*	

During this class you will learn about ***postpartum hemorrhage*** (PPH), which is a *leading cause of maternal mortality*, responsible for more than a quarter of all maternal deaths. Most of these fatal cases of excessive bleeding occur in the first 24 hours after delivery of the baby, because of *complications arising during the third stage of labor*. To minimize the risks of PPH in this critical stage of labor, a set of procedures have been developed that all birth attendants should follow, called ***active management of third stage of labor*** (AMTSL). Correctly applied, AMSTL can reduce the risk of postpartum hemorrhage by more than 60%.

In this study session, you will learn AMTSL procedure, this knowledge will help you to identify the complications that may arise during the third stage of labor and manage them more effectively.

☛ **What happens in the third labor stage?**

The third stage of labor begins with the birth of the baby and ends with the delivery of the placenta and fetal membranes. Normally, it should last less than 30 minutes.

It is not necessary to deliver the placenta immediately. But without manipulation as it may take 30 to 60 minutes.

In a *complication-free labor*, together with the uterine contraction (more powerful because of uterine emptiness after the childbirth) during third stage natural physiological processes occur in the *following order*:

1 Separation of the placenta: The placenta separates from the wall of uterus (see Figure 6.1A and B). As it detaches, blood from the tiny vessels in the placental bed (***uterine spiral arteries***) begins to bleed, then the clot between the placenta and the muscular wall of the uterus (the myometrium) will be formed. This is known as *retroplacental hematoma*. This process can be understood by stable (not removes after contraction) ***cord lengthening***.

2 Descent of the placenta: After the separation and together with the pressure of the retroplacental hematoma placenta moves down the birth canal and through the dilated cervix (see Figure 6.1C). *At this moment uterine upper segment still contracts and appears above the placenta as* ***round shape firm object, that slightly rises*** *to the level of the umbilicus*.

3 Expulsion of the placenta: Then placenta is completely expelled from the birth canal (see Figure 6.1D). *The top of the uterus is usually found by palpation at this moment in the level* ***between the umbilicus and pubic symphysis***.

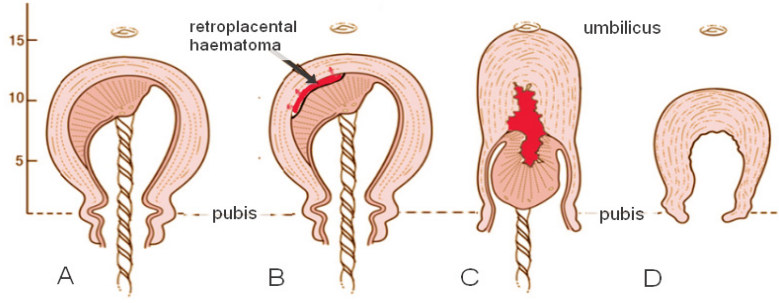


Figure 6.1. A. Placenta not separated at the beginning of third stage. B. Placenta begins separating and a blood clot (retroplacental haematoma) forms behind it. C. Placenta descending through the cervix. D. Placenta completely expelled marks the end of third stage; the uterus contracts powerfully (full explanation in the text).

This expulsion marks *the end of the third stage* of labor.

Thereafter, the uterine muscle continues to contract powerfully and thus close spiral arteries and quickly reduces and stops postpartum bleeding.

These three (uterine emptiness, powerful contraction, and blood clotting) are *main components* of the ***uterine hemostasis***.

Women who give birth to an inexperienced healthcare provider (like you) are more likely to experience complications at all stages of labor, including the third stage. These complications are listed below.

• **Retained placenta** The placenta remains inside the uterus for longer than 30 minutes after delivery of the baby, usually due to one or more of the following:

- Uterine contractions may be inadequate to expel the placenta
- The cervix might have retracted too fast and partially closed, trapping the placenta in the uterus
- The bladder may be full and obstructing placental delivery
- In a more complex case, it may be a pathologically adhered placenta (placenta accreta, increta, percreta) requiring a manual removal by a trained specialist

• **Postpartum haemorrhage (PPH)** is the excessive bleeding with loss of more than 500 ml of blood following delivery of the baby. Most PPH occurs when the uterus fails to contract well, usually due to:

- *Atonic uterus:* the muscular wall of the uterus could not contract powerfully enough to arrest the bleeding which occurs when the placenta separates from previously remodeled spiral arteries *not able to contract by themselves*
- *Partially separated placenta* (it remains partly attached to the uterine wall)
- Completely separated placenta, but its parts *retained* inside the uterus

• **Uterine inversion.** The uterus is pulled 'inside out' as the baby or the placenta is delivered, and partly emerges through the vagina.

They can arise even after a physiological birth. In such cases, while a normal and spontaneous delivery of the placenta during the third stage might be expected, complications can appear unpredictably. You should always be prepared for the unexpected emergency.

☛ **Active management of third stage**

The key to reducing the risk of the complications is to apply **active management of third stage**. The term 'active management' indicates that you are not waiting for spontaneous placental delivery. Instead, you will use methods that will shorten the process of uterine emptiness, provide more early effective uterine contraction and minimize the guaranteed blood loss. All of them need to be applied just after the complete expulsion of the baby according to the following order:

1. Check the uterus for the presence of a second baby by palpating the uterus through the mother's abdomen. When you are sure that the uterus does not contain a second baby, and you can move to the second step (administration of uterotonics). The reason for checking so carefully is because this drug makes the *uterus contract* so powerfully that it will ischemise the uterus and a baby that remains inside it. If you find that there is a twin, provide the birth of the second baby.

2. In less than one minute after childbirth, administer a uterotonic drug. You can give the mother one of the following:

- misoprostol 600 micrograms (mg), i.e., three 200 mg tablets by mouth with a drink of water.

OR (if you carry this in an **icebox**)

- oxytocin 10 international units (IU) injected deep into the woman's thigh muscles (intramuscular injection, IM). *Note that oxytocin and ergometrine always must be kept refrigerated at 2–8°C, so they are not suitable for a home delivery unless the household has a refrigerator, or you have a mobile icebox. They also have to be protected from exposure to light*

OR

- ergometrine 0.4–0.5 mg injected deep into the woman's thigh muscles. *Note that ergometrine is contraindicated for women with* ***hypertension***

When the uterus *is well contracted it will feel* ***very hard***. This should occur between 2-7 minutes after the administration of the drug, depending on which one is given.

3. Observe for signs that the **placenta is separating**:

a. the cord lengthens,

b. a gush of blood comes from the vagina as the placenta detaches from the wall of the uterus, and

c. the fundus changes from a discoid shape (flat) to a globular shape as the placenta drops into the lower uterine segment. Figure 6.2.

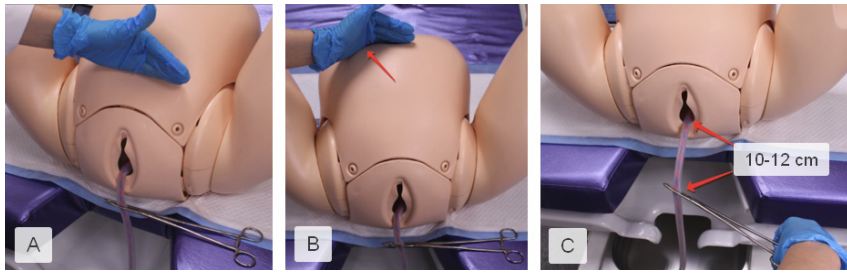


Figure 6.2. Symptoms of separation. A. Umbilical cord lengthens (under the suprapubic pressure). B. Uterus appears round shape firm object, that slightly rises to the level of the umbilicus. C. Umbilical cord lengthens spontaneously for 10 cm and more.

If all the mentioned above symptoms are positive – placenta seems to be separated. At this moment you can ask the woman to push for the placenta delivery. In this case you continue with p. 5.

4. You also may carefully apply ***controlled cord traction with counter pressure*** to help to expel the placenta (see Figure 6.3).

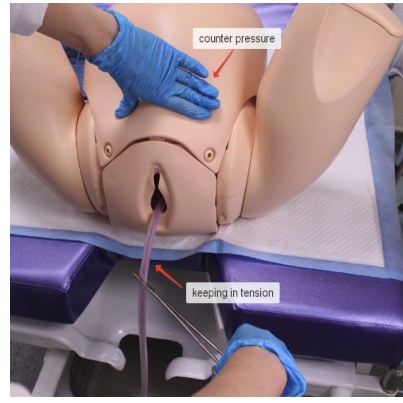


Figure 6.3. Controlled cord traction. The right hand is pulling the clamped umbilical cord (making traction) while the left hand is exerting counter-pressure on the lower abdomen, just above the pubic bone.

For the controlled cord traction.

1) Clamp the umbilical cord close to the perineum (once pulsation of the blood vessels stops in the cord of a healthy newborn) and hold the cord in one hand.

2) Place the other hand just above the woman's pubic bone and stabilize the uterus by applying counter-pressure to the abdomen during controlled cord traction.

3) Keep slight tension on the cord and await a strong uterine contraction (usually every 2-3 minutes).

4) With the strong uterine contraction, encourage the mother to push and very gently pull downward on the cord to deliver the placenta. Continue to apply counter-pressure to the uterus. Between contractions, gently hold the cord and wait.

5) With the next contraction, repeat controlled cord traction with counter-pressure. If the placenta does not descend during 30-40 seconds of controlled cord traction ***do not continue*** *to pull on the cord because of the risk of the* ***uterine inversion.***

5. As the placenta appears in the vulva, hold it by both hands, slowly pull to complete its delivery and gently *turn the placenta until the membranes are twisted to prevent their tearing* (see Figure 6.4).

Figure 6.4. Delivery of the placenta.

Delivery of the placenta marks the end of the third stage of labor.

At this time the uterus should be hard, round and movable when you palpate the abdomen. You should be able to feel it midway between the mother's umbilicus and her upper pubic bone. There should be no bleeding from the vagina. The bladder should be empty.

6. After delivery of the placenta, immediately and gently start *massaging the uterus*. Rubbing the uterus is a good way to contract it and stop the bleeding (Figure 6.5).

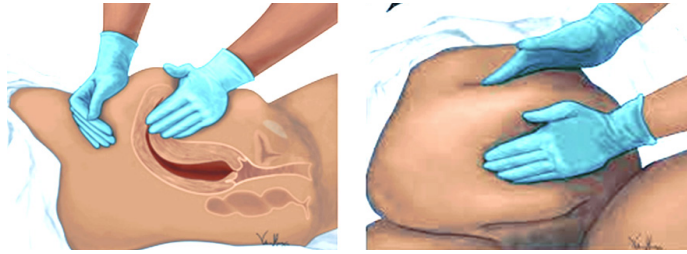


Figure 6.5. Uterine massage (rubbing the uterus).

7. Examine the placenta to make sure it is complete and none of it has been retained in the uterus. If a portion of the maternal surface (see Figure 6.6) is missing, or there are torn membranes with blood vessels, suspect that *retained placenta fragments* remain in the uterus and try to refer the mother quickly.

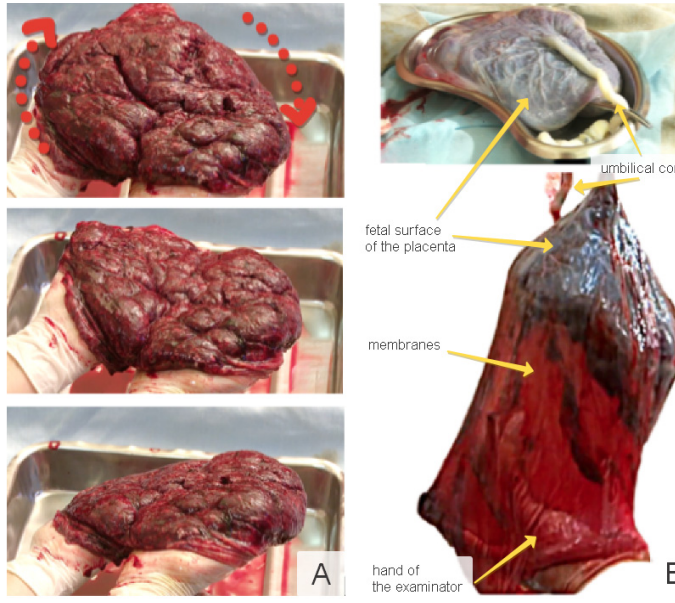


Figure 6.6. Examination of the placenta and fetal membranes A. Checking maternal surface of the placenta to see is it intact (move it for better visualization of possible defects). B. Checking membranes to see are they complete.

Checking the placenta for completeness. *Hold the placenta in the palms of your hands, with the maternal side facing upward (Figure 6.6A). Make sure that all the lobules are present and fit together. Then hold the cord with one hand, allowing the placenta and membranes to hang down. Place the other hand inside the membranes, spreading the fingers out, to make sure that the membranes are complete (Figure 6.6B). Save the placenta by placing it in a plastic bag and possibly freezing it for future transfer to a specialist.*

8. Examine the woman's *vagina, perineum and external genitalia* for lacerations and active bleeding by gentle separation of the labia and inspection of the lower vagina and perineum that may need to be repaired to prevent further blood loss (Figure 6.7). If the membranes tear, gently examine the upper vagina and cervix of the woman by a *sponge forceps* to remove any pieces of membrane that are present (Figure 6.7). It is dangerous for the mother if any parts of the placenta or membranes are left behind in the uterus and may lead to the bleeding or infection (endometritis)

Figure 6.7. Examination of the vagina, perineum and external genitalia for lacerations

9. To complete the management of the third stage of labor gently **cleanse** the vulva and perineum with a weak antiseptic solution. Apply a clean pad or cloth with firm pressure to the area that is bleeding for about 10 minutes. If bleeding continues after this time, suturing is indicated, if this is not possible right now, refer the woman as soon as possible, keeping the pressure applied to the wound.

10. Monitor the woman every 15 minutes - this means measuring 1) her vital signs, 2) massaging her uterus to ensure that it is contracted and 3) checking for excessive vaginal bleeding.

11. Inform the woman and her support person that the birth is about to take place.

12. Reassure the woman that she will be assisted and will not be left unattended.

☛ **Complication management**

Excessive bleeding (postpartum hemorrhage)

Postpartum hemorrhage (PPH) is defined as blood loss of more than 500 mL after a vaginal birth withing first 24 h. PPH occurs in 3-5% of births.

Obstetric hemorrhage is the leading cause of maternal mortality worldwide.

Data have demonstrated that 54% to 93% of maternal deaths related to hemorrhage are preventable and the most common mistakes are ***underestimation of blood loss*** and failure to provide ***adequate volume replacement*** in a timely manner.

Visual estimation can be extremely difficult, and underestimation happens in 30% to 50% cases. That is why you need to maximally objectivize the volume of the blood loss and start with the therapy of an excessive bleeding earlier than 500ml will be obviously lost.

The most common cause of PPH is ***uterine atony***. In this case the uterus is *soft under the palpation and fundus level is equal or above the umbilicus*. Other early causes include the following:

- ***Lacerations*** of the perineum, or vagina, or cervix, or uterus
- ***Retained placenta***l fragments
- ***Coagulation disorders*** (hereditary or acquired)

Here we discuss briefly only the main points of a postpartum hemorrhage management in an emergency non-obstetrical care case.

So, if you see external bleeding exceeding 250-300 ml start with *Rubbing the atonic uterus* and (if you have been trained to do it) using the twohanded pressure method – ***bimanual compression of the uterus*** (Fig. 6.8).

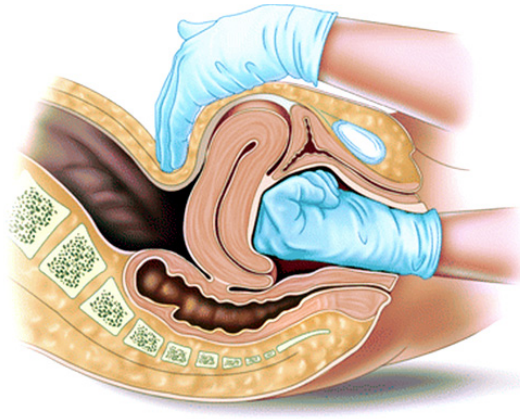


Figure 6.8. Bimanual compression of the uterus.

Giving a second dose of oxytocin 10 IU by intramuscular injection, or a second dose of misoprostol 400 µg rectally (by pushing the tablets gently into the rectum through the woman›s anus), or by putting the tablets under her tongue where they can slowly dissolve.

Initiating breastfeeding immediately after delivery: the contractions that expel the milk will also make the uterus contract.

Remember not to exceed 1,000 mg of misoprostol (5 tablets). If the woman has already taken 600 mg (3 tablets) after the birth of the baby, and she needs a second dose because of excessive bleeding, it should be no more than 400 mg (2 tablets) via the rectum. This way, the woman will have fewer side effects.

If the bleeding does not stop quickly after the second dose of misoprostol, refer the woman to the nearest health facility urgently. Sometimes, bleeding comes from a torn vagina, a torn cervix, or a torn uterus. Usually, this bleeding comes in a constant, slow trickle. The blood is usually bright red and thin. In this case you may try provide a tamponade of the laceration if you are unable to suit it.

Actions to take while waiting for transport or transporting the patient:

• Use positioning to optimize cardiac output - lie the mother down with her feet higher than her head and her head turned sideways; keep her warm with blankets.

• Secure an intravenous (IV) line and begin fluid infusion with Normal Saline or Ringer's Lactate solution. Warm all fluids if possible.

• You may be trained to add a further dose of oxytocin to the fluids in the IV bag, but this is only possible if you can keep the drug refrigerated until needed.

• Monitor respiratory rate and SpO2 trends assessing for potential respiratory compromise from pulmonary edema. Provide oxygen supplementation to maintain SpO2 >95%.

• Keep the area of the vulva and perineum clean.

• Arrange to accompany the mother to the hospital if possible.

• Also ask family members or friends to go with the mother and look after the baby.

Retained placenta.

Retained placenta is when the placenta remains in the uterus beyond 30 minutes after the birth of the baby. If this happens:

• Do not attempt further controlled cord traction to separate the placenta.

• Follow the instructions for pre-referral treatment as given above for PPH and get the woman to a health facility for emergency care as quickly as possible.

Review questions

1. How do you define the third stage of labor?

_____

2. What physiological processes happen during the third stage of a normal uncomplicated labor?

a) _____

b) _____

c) _____

3. What, are the main steps of the active management of third stage

a) Check the uterus for the presence of a _____

b) administer a _____drug

c) Observe for signs _____

d) You also may carefully apply _____

e) As the placenta appears in the vulva _____

f) After delivery of the placenta, immediately and gently start _____ _____

g) Examine _____ to make sure it is complete and none of it has been retained in the _____

h) Examine the woman's _____ _____for lacerations

i) Monitor the woman every _____ for 1) _____,

2) _____

3) _____

4. Imagine that you have managed the third stage of labor for a woman by correctly using the active management, but she has developed continuous bleeding.

a) Do you provide additional misoprostol? If yes, what dose should you give her and in what form? _____ _____

b) If she still bleeds what else could you do? _____ _____

c) What should you do if the woman continues to bleed? _____ _____

5. Match the signs and symptoms in Column B with the diagnoses in Column A (for every diagnosis find two symptoms).

1. Retained placenta	A. Uterus feels firm
2. Laceration of the cervix and vagina	B. Bleeding seen easily from torn tissue
3. Laceration of the perineum or labia	C. Bright red vaginal bleeding
4. Atonic uterus	D. Soft uterus
	E. Dark red bleeding with or without clots
	F. Watery discharge
	G. Defect of the placenta

6. If the source of excessive postpartum bleeding is retained pieces of placenta, what should you do?

a) _____
b) _____
c) _____
d) _____

7. Which of the following situations place the woman at risk for excessive bleeding after the birth?

a) Grand multiparity
b) Short, rapid labor
c) Small baby
d) Oxytocin induction/augmentation

REVIEW ANSWER KEY

1. The third stage of labor begins with the birth of the fetus and ends with the delivery of the placenta and its attached membranes

2.

a) placenta separates
b) placenta moves down the birth canal
c) placenta and membranes expell

3.

a) another baby
b) uterotonic
c) placental separation
d) controlled cord tractions
e) torn it to twist the membranes and not tear them
f) massaging uterus
g) placenta, uterus
h) perineum, vagina, cervix
i) 15 min 1) vital signs, 2) uterine massage, 3) vaginal blood loss

4.

a) Misoprostol up to 1000 micrograms tablets given orally with water, or oxytocin 10 IU intramuscularly

b) Rubbing the atonic uterus, if been trained – bimanual compression of the uterus, start breastfeeding, re-check for atony, trauma, retained placenta and bleeding disorder

c) need refer patient to an obstetrical clinic very fast, providing proper position, heating, fluid infusion, monitorin of the circulation and respiration, compression of the uterus (if needed)

5.

1. E,G 2. A,C 3. A,B 4 D,E

6.

a. Massage the top of the uterus
b. Administer oxygen, if needed
c. Increase the rate of administration of intravenous fluid
d. Take and record blood pressure and pulse

7. a, b, and d

Practical part

During the practical class you need to show in phantoms management of an unexpected or precipitous birth according to a following check list:

Example of the task

"You arrive a scene where a woman just delivered a live neonate without any complications. You're in the admission department of a small clinic, all other staffs are busy with patient in serious condition. You need to manage the third stage of labor. Comment all your manipulations"

The check list example

Date		Student's name		
Third labor stage			Task number	

N	Tasks	Ratings		
		0	**1**	**2**
1.	Introduce yourself to the patient including your name and role Confirm the patient's name Call for assistance			
2.	Wash hands, wears clean gloves			
3.	Ask for antiseptic, two sponge forceps, scissors, medical tray and gauze pads			

4.	Palpate the abdomen to rule out the presence of an additional baby			
5.	Clamp the cord by two sponge forceps, cut it by scissors			
6.	Check and report about positive signs of the placental separation (uterus become globular and rotated to the right, cord lengthens and not return under suprapubic pressure, ± gush of blood appears)			
7.	Ask woman to push for the placenta delivery			
8.	As the placenta is not delivered hold the clamped cord and the end of the forceps with one hand, while another place just above the woman's pubic bone and stabilize the uterus by counter-traction during. Keeps slight tension on the cord and await a strong uterine contraction			
9.	With the uterine contraction apply traction on the cord, continuing counter-traction to the uterus with the other hand			
10.	Take the placenta in two hands and gently turn it several times in a clockwise fashion until the membranes are twisted. Slowly pull to complete the delivery			
11.	Examine the placenta carefully to be sure none of it is missing inside the uterus			
12.	Examine the woman for any tears to the perineum or vagina			
13.	Estimate blood loss (medical tray)			
14.	Encourage the woman to empty her bladder (by words)			
15.	Clean mother's perineum, delivery surface			
16.	Wash your hands, remove gloves			
17.	Congratulate the patient and her family			

	Report the need to monitor every 15 minutes for 2 subsequent hours complains of the woman, uterine tone, blood loss volume, BP, body temperature – once (if normal)			
	Total score Rating “3” – 25-28 Rating “4” – 29-31 Rating “5” – 32-36			

RECOMMENDED LITERATURE

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Educational publication

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SIMULATION TRAINING COURSE IN OBSTETRICS

Study guide

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