

PHYSIOLOGY OF LABOR

Department of Obstetrics
and Gynecology, number 1
KhNMU

Normal labor - these are the labor with spontaneous onset and progression in low-risk pregnant at 37-42 weeks of gestation, the fetus in cephalic occipital presentation ,with satisfactory condition of mother and newborn after delivery.

Childbirth - a complex multilinks physiological act that occurs and terminates as a result of interaction of many organs and systems and expulsion of fetus, placenta and fetal membranes with amniotic fluid from the uterus through the birth canal.

Theories of labor onset

- ✓ Hippocratic theory
- ✓ The theory of a "foreign body"
- ✓ Mechanical theory
- ✓ Immunological theory
- ✓ Placental theory
- ✓ Chemical theory
- ✓ Endocrine theory

The causes of the labor onset

- Trigger release is accompanied by excitation of acetylcholin by nerve terminal receptors , thereby changing the balance inside the cell and in the extracellular space, as well as by cell membranes;
- oxytocin, synthesized in the mother and fetus, provides for the release of prostaglandins due to ischemia of the myometrium and the release of high concentrations tonomotor substances (serotonin, prostaglandins , catecholamines , etc.), which was accompanied by decreasing the concentration of their inhibitors and mediates activation of the uterine receptors;

- ✓ Prostaglandins inhibit delay of calcium in the cells, release of which is accompanied by a reduction of the myometrium;
- ✓ energy produced by the breath and glycolysis against high level of enzymes and the mandatory presence of calcium ions, potassium, sodium and magnesium;
- ✓ uterine contractions provided by donors of energy - macroergic phosphates, which store energy so called phosphocreatine and ATP;

Physiological changes that precede childbirth offensive

- Restructuring the CNS and the formation of "the labor dominant."
- Increased excitability of the myometrium (hormones, neurotransmitters, electrolytes, etc.).
- Relative oligohydramnion develops (fetal growth outstrips formation of amniotic fluid).
- Fetal movement become more active.
- Lowered fetal presenting part (impact of receptors).
- "Points" the cervix.
- Appear predictive contractions.
- Women's weight loss.

Labor forces

- ✓ **Contractions** - periodic involuntary reduction of the uterus, are the process of contraction and retraction
- ✓ **Stadium incrementi** – increase
- ✓ **Acte** - the highest degree of reduction
- ✓ **Stadium decrementi** - gradually transformed into a relaxing break
- ✓ **Bearing down-to** involuntary contractions of the smooth muscles of the uterus joins a reflex contraction of striated skeletal and abdominal muscles, diaphragm, pelvic floor

Stages of delivery

I stage – cervical

- contraction -reduction
- retraction - change in the relative location
- distraction - stretching muscles in the sides and top

II period - expulsion

III period –expulsion of the after-births

Scale of levels of maturity of the cervix (By E.H.Bishop)

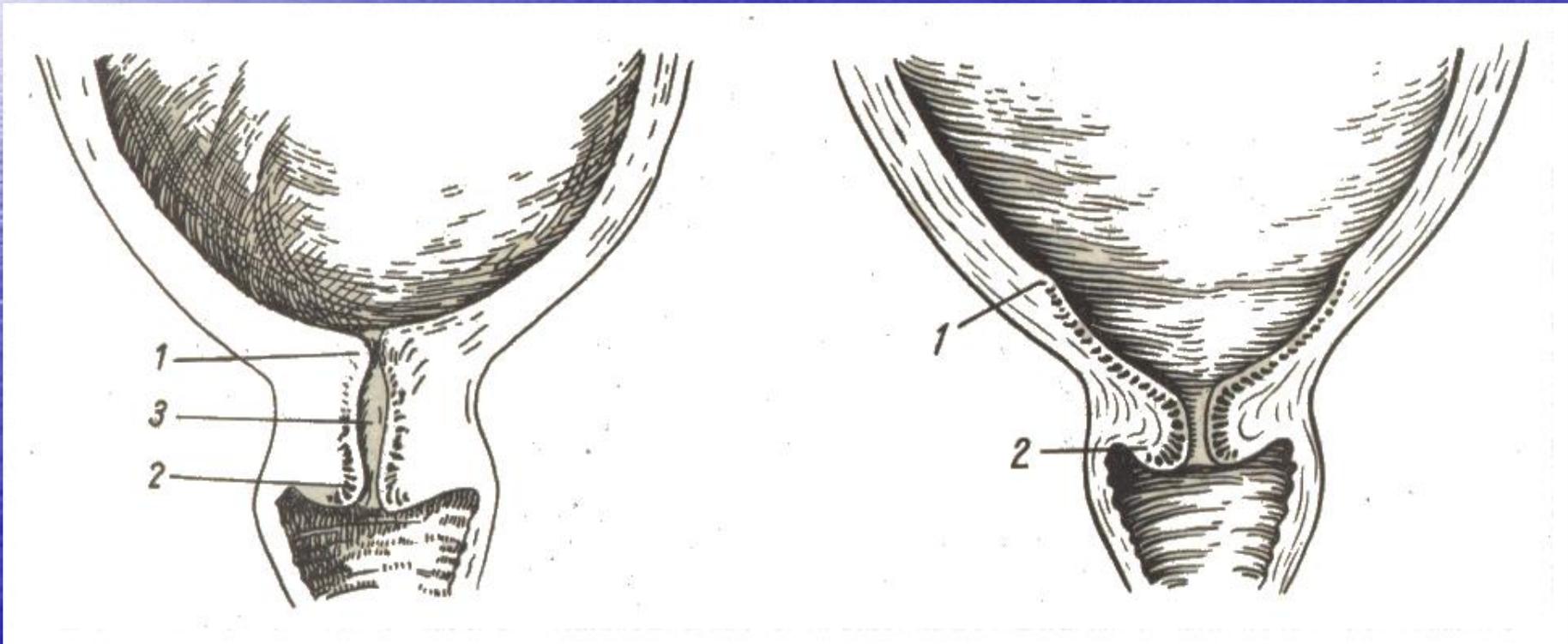
Index	Points		
	0	1	2
Consistency of cervix	Thick	Softened at the periphery, in the internal os	Soft
Cervical length	More than 2 cm	1-2 cm	Less than 1 cm
Patency of the cervical canal	External os closed, but misses the fingertip	Cervical canal is passable up to the internal os	Canal passable for one or more fingers out of internal os
Position of the cervix relatively to the axis of the pelvis	Set back	Between the sacrum and pelvis axis	Along the axis of the pelvis

I stage of labor

- ✓ Latent phase - to 8 hours, the rate of opening of 0.3-0.5 cm per hour. Effacement and dilatation of the cervix up to 3 - 3.5 cm
- ✓ Active phase - disclosure rate of 1.0 -1.5 cm / hour, opening up to 8 cm
- ✓ deceleration phase -1 -1.5 hours lasts until full disclosure of the uterine os, speed of opening- 0.8-1.0 cm / hour

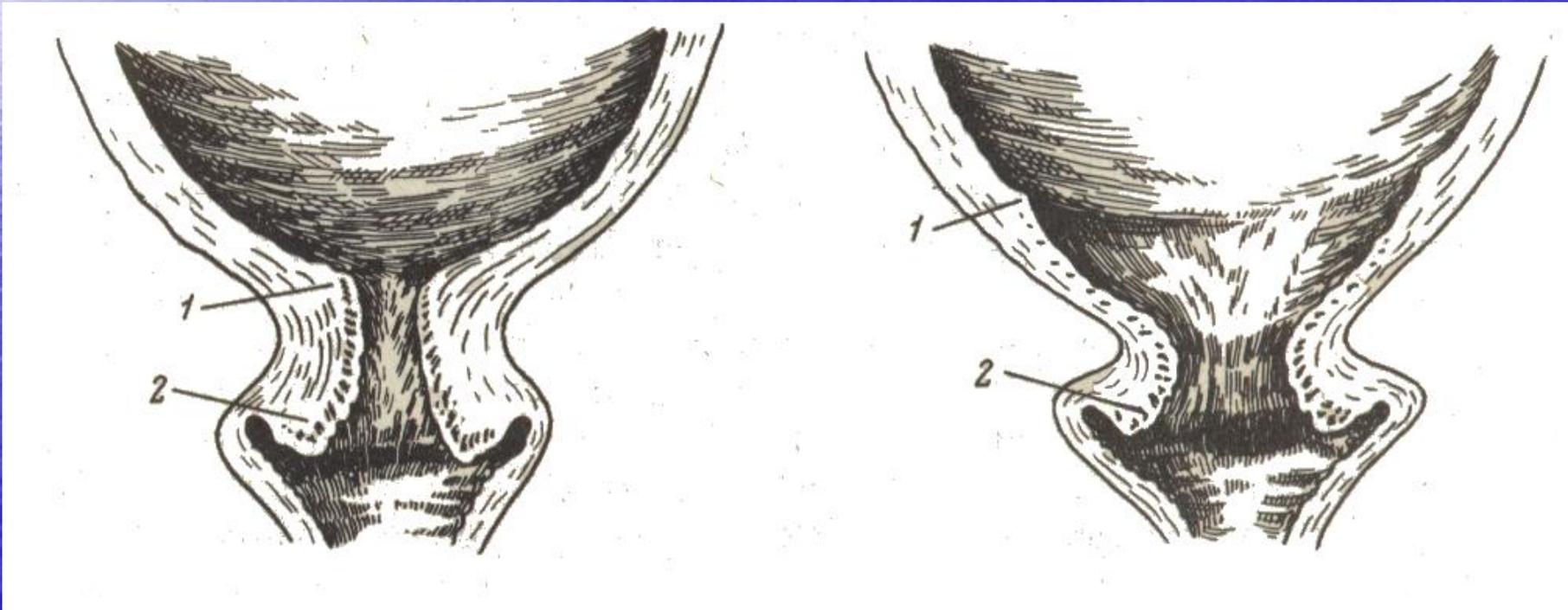
CERVICAL DISCLOSURE

Primigravida- complete effacement of the cervix occurs at first (by opening the internal cervical os), then dilatation of the cervical canal and only then - the disclosure (owing to the external os).

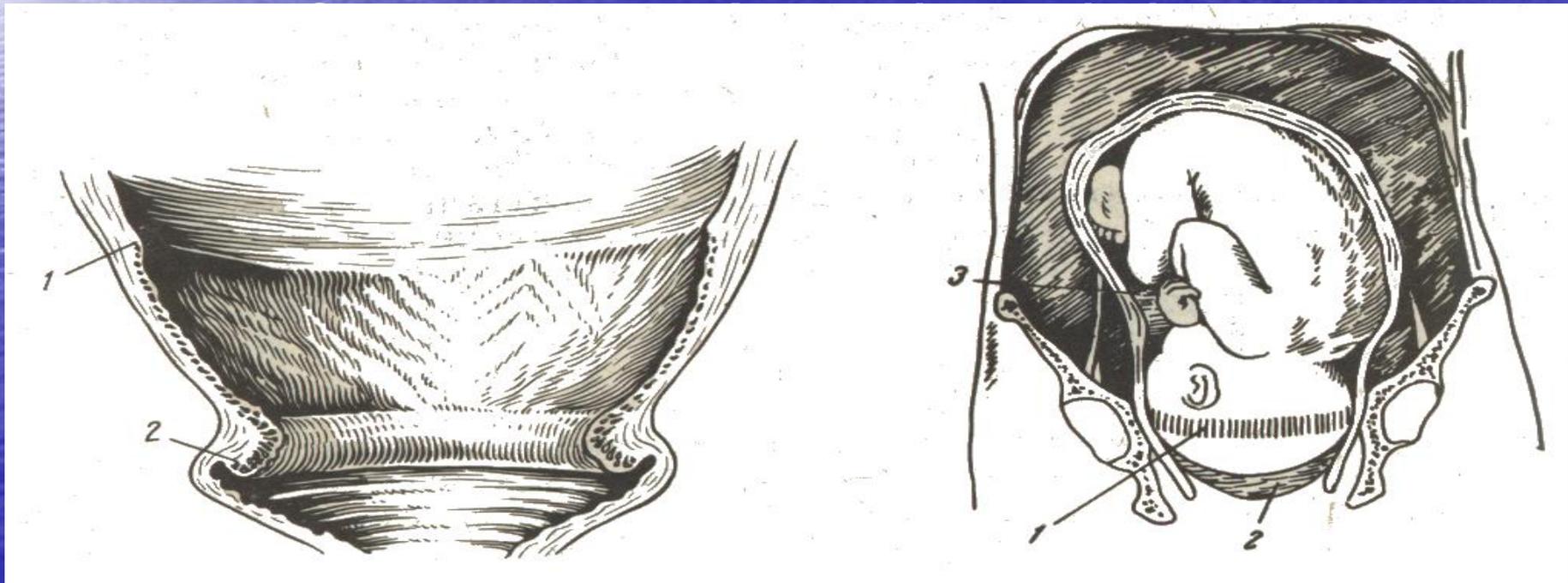


CERVICAL DISCLOSURE

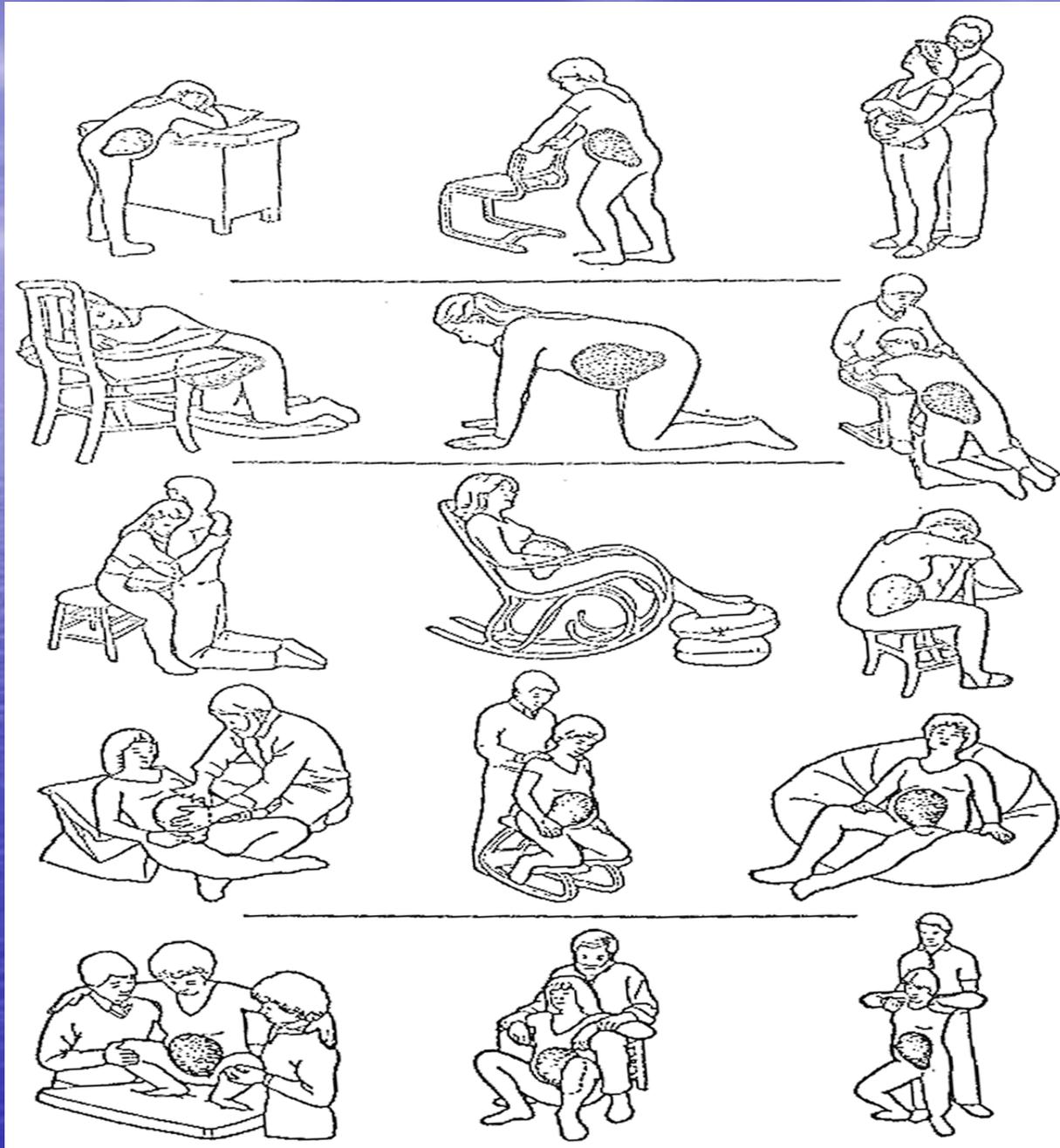
- Multipara – ‘taking up’ and dilatation of the external os occur simultaneously.



- Full cervical dilatation is considered disclosure by 10 - 12 cm, the cervix is not defined during vaginal examination, palpable only presenting part of the fetus.
- The abutment head to the walls of the lower uterine segment is called the contact zone



Position of women in labor in the first stage

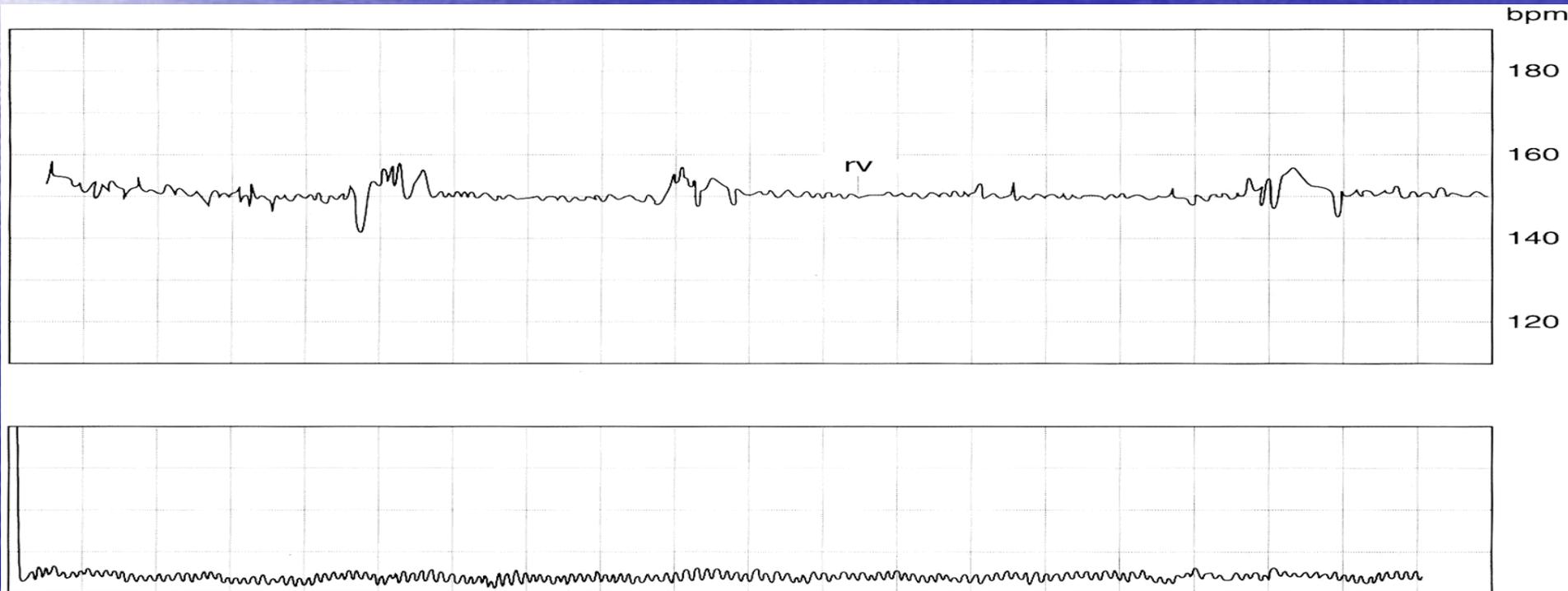


II stage of labor

- This stage is concerned with the descent and delivery of the fetus through the birth canal
- The second period is determined by the totality of all the successive movements, which carries the fetus during the passage through the mother's birth canal and is characterized as Biomechanisms of childbirth.
- Depending on the position, fetal presentation, view – type of biomechanism delivery will be different.
- When descent the fetal presenting part (head) on the pelvic floor there are bearing down. Duration of contractions in the II period is 40 - 80 sec., after 1 - 2 minutes.

Conducting of II stage of labor

- Assessment of parturient woman: measurement of blood pressure and heart rate every 10 minutes
- Monitoring the fetal heart rate every 10 minutes



Conducting of II stage of labor

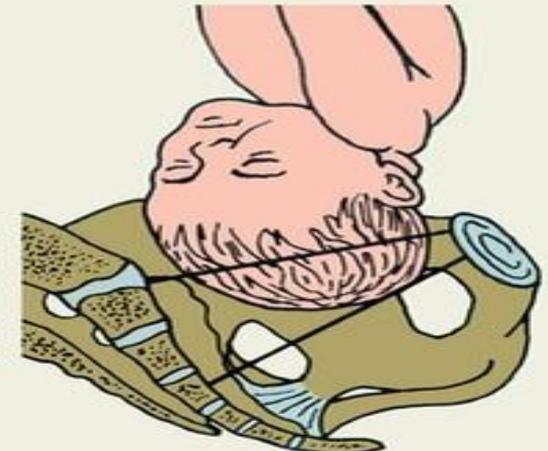
- Monitoring the progress and condition of the head of the



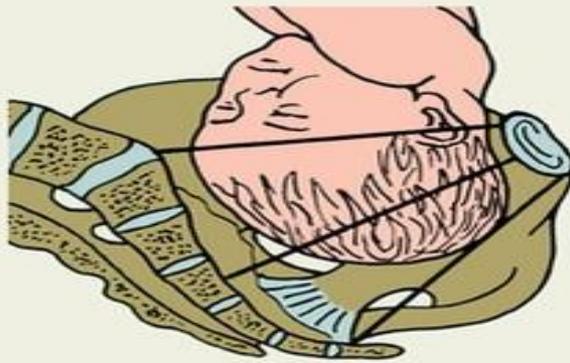
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Conducting of II stage of labor

- ✓ If amniotic fluid is not escape in a timely manner - spend amniotomy
- ✓ Careful manual assistance at birth the baby's head (preservation of the integrity of the perineum and the prevention of intracranial and spinal cord injury)

Conducting of II stage of labor

- ✓ For the ensuring a woman's rights she will be informed about opportunity to choose a convenient position both for her and for the medical staff
- ✓ Episio-, or perineotomy held by a physician on the testimony and providing preliminary anesthesia

5 maneuvers protect the perineum

➤ Purpose:

- Prevent rupture of the perineum.
- Withdraw fetal head without damaging it.

➤ Maneuvers:

- Prevention of premature extension and rapid advance of the head.
- Extrusion of the fetal head out of pushing.
- Tension reduction and borrowing of perineal tissues.
- Regulation of bearing down attempts.
- Extrusion of the shoulders and the birth of the fetus.

Two tactics, III stage of labor:

- ✓ Expectant (physiological) approach and in this case - only treatment of complications should they arise;
- ✓ Active management of the third period with any uterotonic.

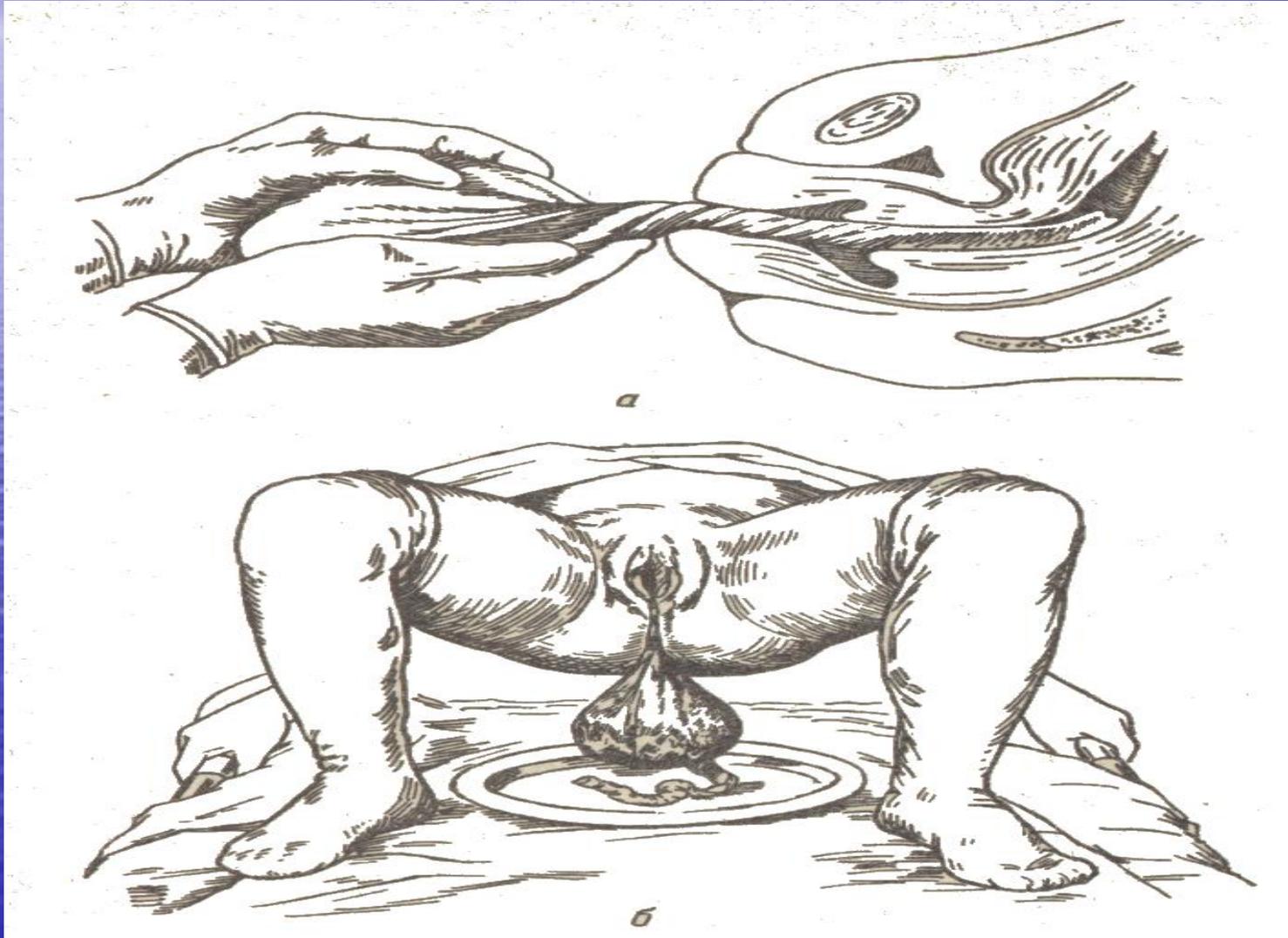
Conducting of III stage of labor

- ✓ In order to prevent bleeding in the first minute after the birth of the fetus as an intramuscular injection of 10 IU oxytocin
- ✓ Held control cord traction is an indication only when the placenta have separated from walls of the uterus

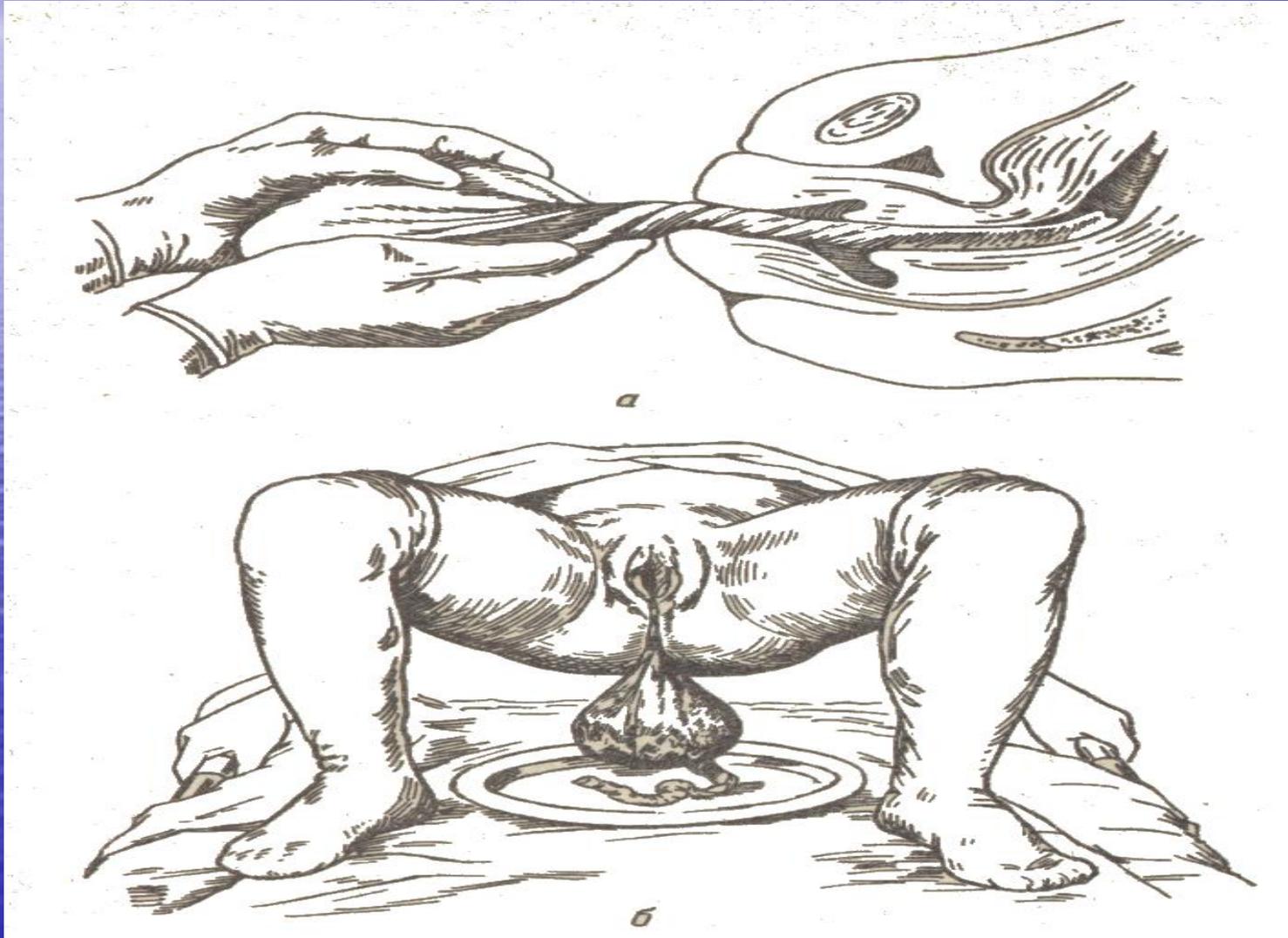
The third stage of labor

- During this period there is a separation and isolation of the placenta from the uterus.
- Successive period lasts an average of 15 - 30 min. Blood loss should not exceed 0.5% by weight of a woman's body, with an average of 250 - 300 ml.
- The uterus is immediately reduced in size significantly after the birth of the fetus , so in a few minutes the uterus is in a state of tonic contraction, and then start "after birth" contractions

- Placenta with membranes separates from the walls of the uterus and is born out of the uterus due to its contractions.



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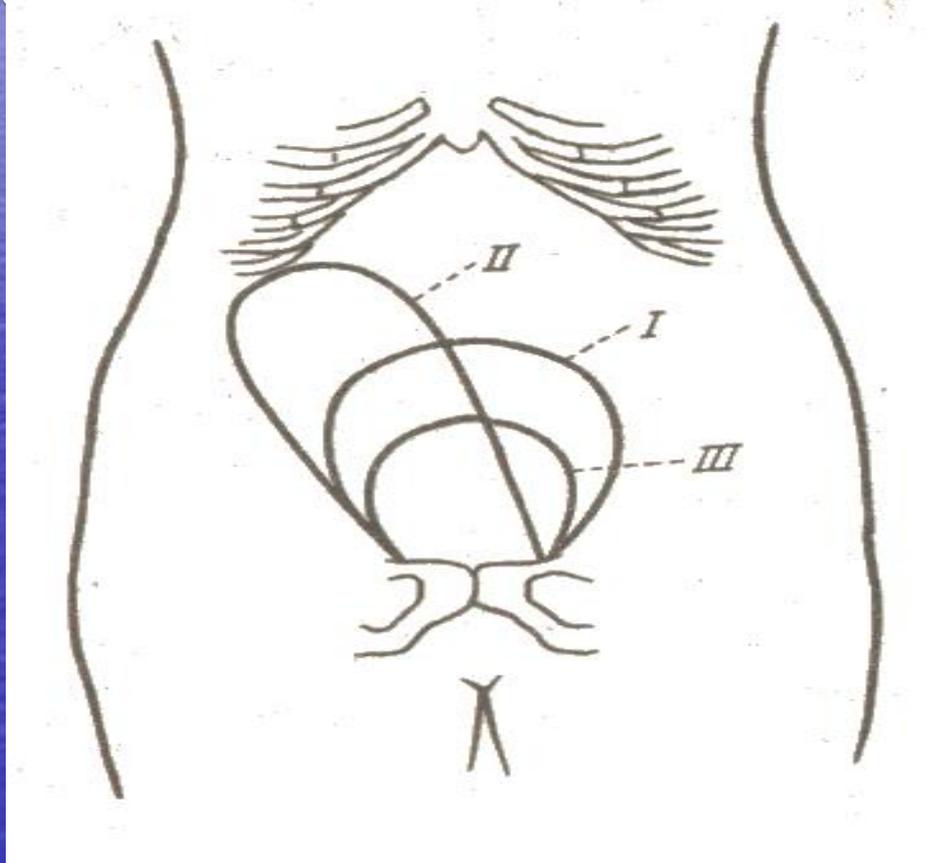


Types of placenta detachment

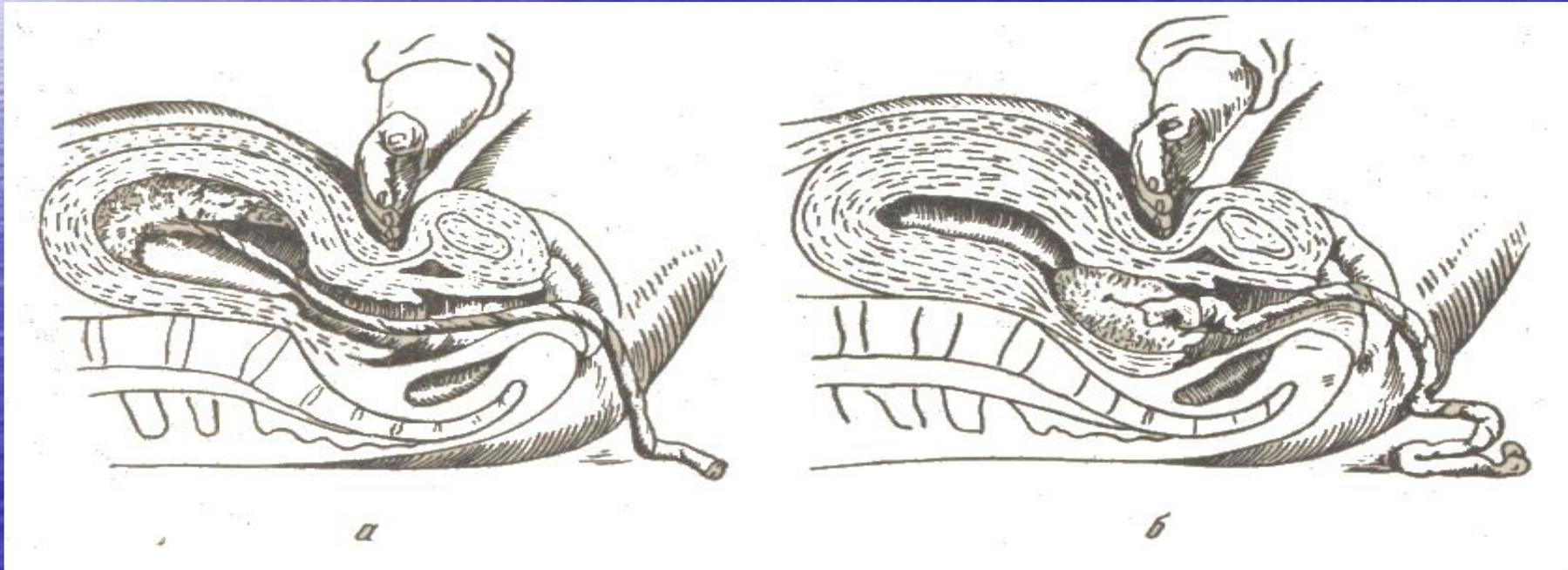
- ✓ Type I - central (by Schulze), when the placenta separates from the center and its attachment formed retroplacental hematoma, which promotes the subsequent separation of the placenta. In this case, the last born by fetal surface outward.
- ✓ Type II - peripheral (by Duncan), in which the latter begins to separate from the edge of the placenta, retroplacental hematoma is not formed, and the last born by maternal surface outside.

Signs of separation of the placenta:

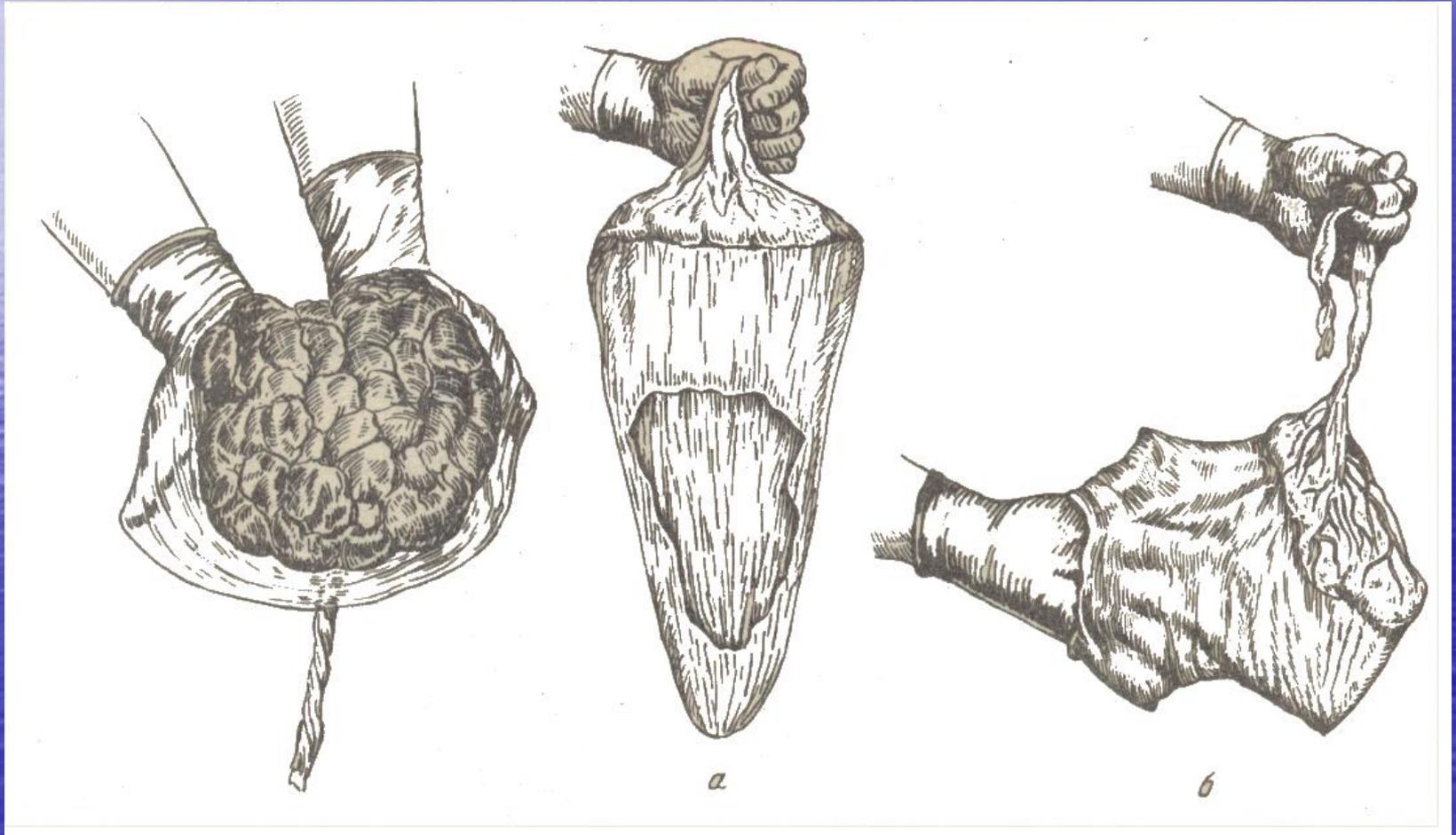
- ✓ Schroeder - change the shape and height of the bottom.
- ✓ Alfeld - extension of the external segment of the umbilical cord (clip drops to 10 - 12 cm from the genital slit).



- ✓ -Kyustner- Chukalov's Sign- when pressed edge of the palm above the symphysis umbilical cord is pulled, if the placenta separated from the uterine wall. (Do not pull the cord, massage the uterus, etc.!).



After the birth of placenta -subsequent
examine in detail to identify gaps and
damage.

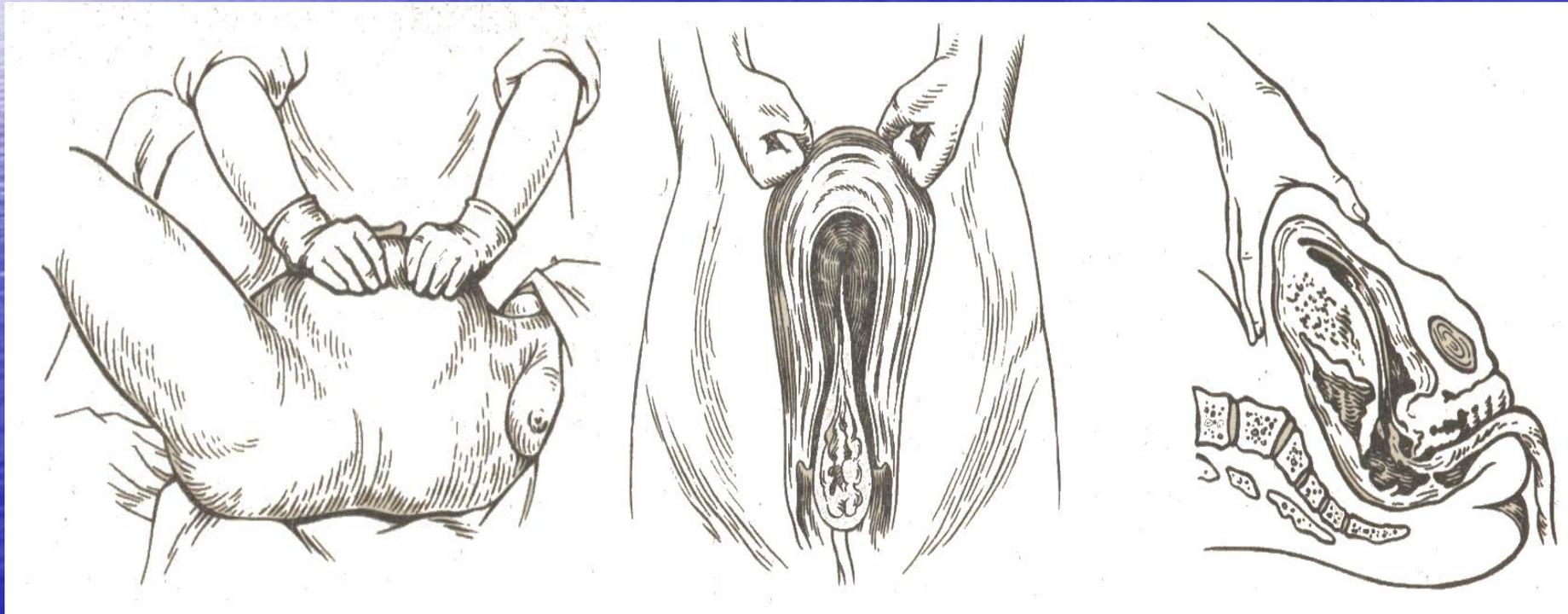


INSPECTION OF MEMBRANES



Technique to separate the placenta

- ✓ Method Abuladze
- ✓ method Günter
- ✓ By Crede-Lazarevich



- If within 30 min. no signs of separation of the placenta - start to manual removal and separation of the placenta!

Conducting of III stage of labor

- Using ice packs inappropriate
- With no signs of placental separation and external bleeding for 30 minutes after the birth of the fetus is performed manual removal of the placenta and the separation of the placenta

Conducting of III stage of labor

- ✓ Immediately after birth of the placenta uterus is massaged through the abdominal wall
- ✓ Woman offers to urinate
- ✓ Bladder catheterization performed on the testimony

Indications for the inspection of the cervix in the mirrors

- ✓ Instrumental delivery
- ✓ Bleeding
- ✓ Metrypercinesia(rapid labor)

PRIMARY TOILET of NEWBORN

- At birth, the fetus and is called as newborn and estimated by Apgar scores at 1 and 5 minutes for 5 features:
- HR - 2 points
- Breathing - 2 points
- Skin color - 2 points
- Muscle tone - 2 points
- Reflexes - 2 points
- After that the primary toilet of newborn: treatment of upper respiratory tract, the processing of the cord, weighing, measuring, processing eyes and genitalia, as well as an assessment of its term and maturity.

Newborn care

- ✓ When a satisfactory condition of the mother, fetus is put on her abdomen after births, rubbed by dry diaper and put the clamp on the cord after 1 min and the intersection of the umbilical cord.

Newborn care

- ✓ When needed - remove mucus from the mouth.
- ✓ Worn hat, socks.
- ✓ Provided "thermal chain": the child is placed on the mother's abdomen and covered with her by blanket. Contact "skin to skin" is conducted while the implementation of sucking reflex, but not less than 30 minutes.

Newborn care

- ✓ After 30 minutes, the cord being processed.
- ✓ Free baby swaddled and transfer from the delivery room with his mother.
- ✓ **UP TO THIS MOMENT THE NEWBORNS DOES NOT CARRY OUT FROM THE LABOR ROOM**

Newborn care

- ✓ Assessment of the newborn is made on the 1st and 5th minute of Apgar scores.
- ✓ In the first 30 minutes the temperature of the newborn is measured and recorded in the map development of the newborn.
- ✓ During the first hour of life is carried out preventive of ophthalmia 1% tetracycline or erythromycin ointment 0.5%.

- **FIRST 2 HOURS AFTER DELIVERY**
puerperas and the baby is in the delivery room, then transferred to the postnatal ward where evaluates the status every 15 minutes. For 2 hours.

- **PARTOGRAPH** - (insert in history birth f. 096/0) is a graphical record flow of labor, the mother and the fetus state, designed to enter information on the results of observations made during the birth ,state of mother, fetus, processes of cervical dilatation and fetal head advancement.

Partograph

main components

- I - the fetus - heart rate, the state of the amniotic sac and amniotic fluid, the configuration of the head.
- II - during birth - rate of cervical dilatation, descent of the fetal head, uterine contractions, oxytocin mode.
- III - the woman's condition - pulse, blood pressure, temperature, urine (volume, protein, acetone), drugs that are introduced during childbirth.

The fetus condition

HEART RATE. TAB. 1

used to record the fetal heart rate, which in the I stage of labor are calculated and recorded in the partogram every 15 minutes, and in the II period are heard every 5 min after attempts and recorded in the partogram every 15 minutes. Each square in the table are themselves time span of 15 minutes. Fetal heart rate should be registered within 1 min (before or after a contractions or attempts), the woman then lies on her side.

Amniotic fluid and fetal head configuration

tab. 2 :

- ✓ integrity of membranes (H – hole a bag of waters) and water condition at rupture of membranes (T - transparent water , M - meconium stain water, B - water stained with blood), which is determined for each internal OB exam.
- ✓ the power configuration of the fetal head (I st - skull bones separated by connective tissue, joints easily palpated , II - bone in contact with one single, seams are not detected, IIIst - bones are on one another, can not be separated , expressed configuration of the head) . indicated by: I. - (-) . e II - (+) III - (+ +).

During childbirth

Tab. 3 shows:

Dynamics of cervical dilatation and passing of fetal head. These data are defined after internal examination

Research conducted at admission to the labor room ,after escape of amniotic fluid or every 4 hours during childbirth.

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LINE ALARM - begins at the point that corresponds to the disclosure of 3 cm and continues until the opening of the cervix with the speed of opening of 1 cm / hour.

ACTION LINE - runs parallel to the alert line, departing at 4hr right away.

The woman's condition

tab. 6 fills in the case of using other medications.

tab. 7 shows the pressure (determined every 2 hours), heart rate (every 2 hours), body temperature (every 4 hours), urine volume (every 4 hours), protein, urine acetone (according to indications).

Factors causing pain during labor

- Dilatation of the cervix
- Compression of the nerves
- Stretching of uterine ligaments

Methods of pain relief in labor:

- Medication
- Nonmedicamentous

MEDICAL METHODS FOR PAIN RELIEF IN LABOR

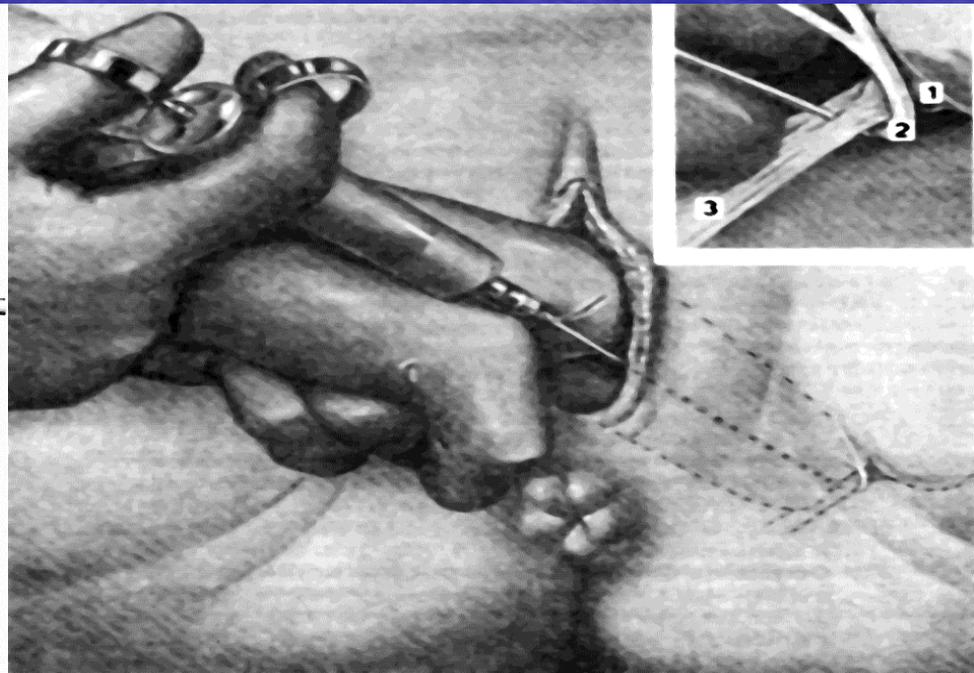
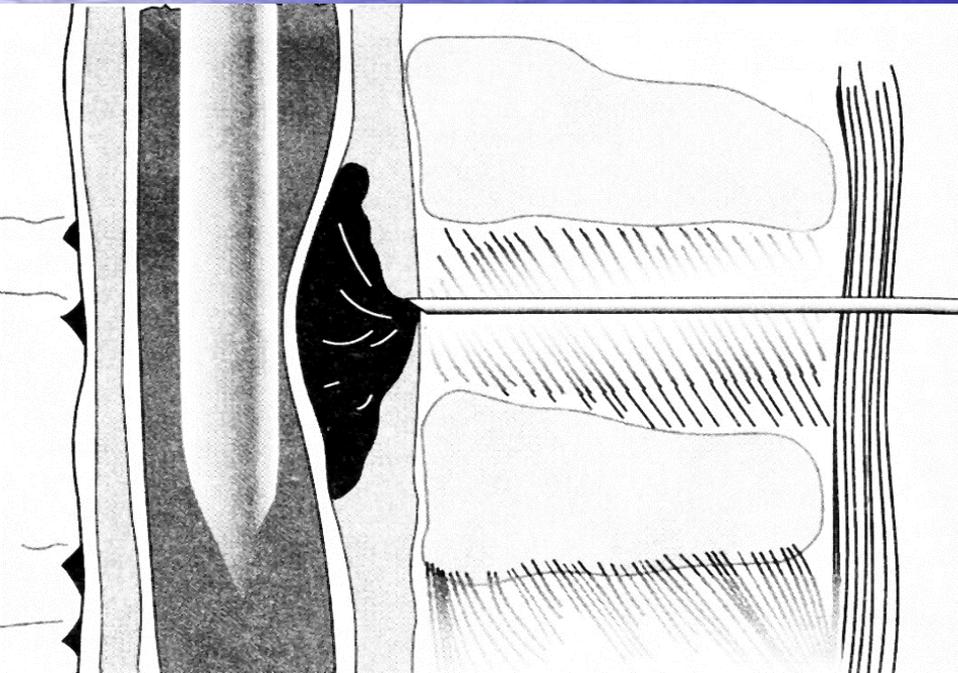
Requirements for them:

- Analgesic effect
- No negative impact on the mother and fetus
- No negative impact on the generic activities
- The simplicity and accessibility for all maternity hospitals

Medical methods of pain relief in labor

Drugs

- ✓ Non-inhalant (systemic) anesthetics
 - ✓ Inhalation anesthetics
 - ✓ Regional Anesthesia



Non-pharmacological methods of pain relief in labor

- ✓ Psychological support by partner
- ✓ Active behavior of mothers during 1-st stage of childbirth
- ✓ Music and aromatherapy by essential oils
- ✓ Shower, bath, massage