

**1. The formation of functional system "mother - placenta - fetus": fertilization, early embryogenesis, implantation.**

**FERTILIZATION OF THE OVUM AND CLEAVAGE OF THE ZYGOTE**

Fertilization (the union of egg and sperm) occurs in the fallopian tube; and it is generally agreed that fertilization of the ovum must occur within minutes or no more than a few hours after ovulation. Consequently, spermatozoa must be present in the fallopian tube at the time of ovulation.

**Ovulation**

After fertilization in the fallopian tube, the mature ovum becomes a zygote—a diploid cell with 46 chromosomes—that then undergoes segmentation, or cleavage, into blastomeres. The first typical mitotic division of the segmentation nucleus of the zygote results in the formation of two blastomeres. The zygote undergoes slow cleavage for 3 days while still within the fallopian tube; fertilized human ova that are recovered from the uterine cavity may be composed of only 12 to 16 blastomeres. As the blastomeres continue to divide, a solid mulberry-like ball of cells, referred to as the morula, is produced. The morula enters the uterine cavity about 3 days after fertilization. The gradual accumulation of fluid between blastomeres within the morula results in the formation of the blastocyst. The compact mass of cells at one pole of the blastocyst, called the inner cell mass, is destined to be the embryo. The outer mass of cells is destined to be the trophoblasts.

**IMPLANTATION**

Just before implantation, the zona pellucida disappears and the blastocyst touches the endometrial surface; at this time of apposition, the blastocyst is composed of 107 to 256 cells. The blastocyst adheres to the endometrial epithelium, and implantation occurs most commonly on the endometrium of the upper part and on the posterior wall of the uterus. After gentle erosion between epithelial cells of the surface endometrium, the invading trophoblasts burrow deeper into the

endometrium, and the blastocyst becomes totally encased within the endometrium, being covered over by the endometrium.

### **1. The formation of functional system "mother - placenta - fetus": fertilization, early embryogenesis, implantation.**

Fertilization (oocyte + spermatozoid = zygote)

Zygote → morula → blastocyst

Implantation of the blastocyst in the endometrium 2 phases:  
intratubular (day 0 – day 3)  
intratubular

Week 2:

Development of bilaminar germ disk with epiblast and hypoblast layers

Production of b-HCG (human chorionic gonadotropin)

First positive pregnancy tests

Week 3:

Trilaminar germ disk with ectoderm, mesoderm and endoderm layers (day 4 – day 6)

Major organs and systems are being formed:

- ectoderm: nervous system; skin, hair, and nails
- mesoderm: muscles, cartilage, cardiovascular and urogenital systems
- endoderm: lining of gastrointestinal and respiratory tracts

MAJOR TERATOGENIC RISK!

### **2. The development and functions of the placenta**

The Placenta and Fetal Maternal Tissues of the Fetal-Maternal System

There are two arms of the fetal-maternal communication system of human pregnancy.

The extravillous and villous trophoblasts are the embryonic-fetal tissues of the anatomical interface of the placental arm;

the avascular fetal membranes—the amnion and chorion laeve—are the fetal tissues of the anatomical interface of the paracrine arm of this system.

The placental arm of this system links the mother and fetus as follows:

maternal blood (spurting out of the uteroplacental vessels) directly bathes the syncytiotrophoblast, the outer surface of the trophoblastic villi;

fetal blood is contained within fetal capillaries, which traverse within the intravillous spaces of the villi. This is a hemochorionic type of placenta.

The paracrine arm of this system links the mother and fetus through the anatomical and biochemical juxtaposition of (extraembryonic) chorion laeve and (maternal uterine) decidua parietalis tissue.

Therefore, at all sites of direct cell-to-cell contact, maternal tissues (decidua and blood) are juxtaposed to extraembryonic cells (trophoblasts) and not to embryonic cells or fetal blood. This is an extraordinarily important arrangement for communication between fetus and mother and for maternal (immunological) acceptance of the conceptus.

The role of the placenta in nidation and in the transfer of nutrients from mother to embryo-fetus has longed fueled interest in this unique organ.

#### PLACENTAL SIZE AND WEIGHT

The total number of cotyledons remains the same throughout gestation. Individual cotyledons continue to grow, although less actively in the final weeks. Placental weights vary considerably. The placenta at term varies widely, but it is, on average, 185 mm in diameter and 23 mm in thickness, with an average volume of 497 mL, and weight of 508 g. There are multiple shapes and forms of the human placenta and a variety of types of umbilical cord insertions. Viewed from the maternal surface, the number of slightly elevated convex areas called lobes (or if small, lobules) varies from 10 to 38. These lobes are separated, albeit incompletely, by grooves of variable depth, the placental septa. The lobes are also referred to as cotyledons.

#### 2. The development and functions of the placenta.

is an organ that connects the developing fetus to the uterine wall.

#### FUNCTIONS:

- nutrient uptake
- waste elimination
- gas exchange via the mother's blood supply
- fighting against internal infection
- production of hormones to support pregnancy

#### Placenta development

Begins upon implantation of the blastocyst into the endometrium. The outer layer of the blastocyst becomes the trophoblast, which forms the outer layer of the placenta.

This outer layer is divided into two further layers: the underlying cytotrophoblast layer and the overlying syncytiotrophoblast layer.

Development of the maternal blood supply to the placenta is complete by the end of the first trimester of pregnancy (approximately 12–13 weeks).

### **3. Functions of the amniotic fluid. Polyhydramnios and oligohydramnios.**

#### **AMNIOTIC FLUID**

In early pregnancy, amniotic fluid is an ultrafiltrate of maternal plasma. By the beginning of the second trimester, it consists largely of extracellular fluid which diffuses through the fetal skin, and thus reflects the composition of fetal plasma. After 20 weeks, however, the cornification of fetal skin prevents this diffusion and amniotic fluid is composed largely of fetal urine. The fetal kidneys start producing urine at 12 weeks' gestation, and by 18 weeks are producing 7 to 14 mL per day. Fetal urine contains more urea, creatinine, and uric acid than plasma, as well as desquamated fetal cells, vernix, lanugo, and various secretions. Because these are hypotonic, the net effect is decreasing amniotic fluid osmolality with advancing gestation. Pulmonary fluid contributes a small proportion of the amniotic volume, and fluid filtering through the placenta accounts for the rest. Amniotic fluid serves to cushion the fetus, allowing musculoskeletal development and protecting it from trauma. It also maintains temperature and has a minimal nutritive function. Ingestion of amniotic fluid into the lung and gastrointestinal tract may promote growth and differentiation of these tissues by inspiration and swallowing amniotic fluid. A more important function, however, is to promote the normal growth and development of the lungs and gastrointestinal tract. The formation of intrapulmonary fluid and, at least as important, the alternating egress and retention of fluid in the lungs by breathing movements, are essential to normal pulmonary development.

#### **METABOLIC FUNCTIONS**

The amnion is metabolically active, involved in solute and water transport to maintain amniotic fluid homeostasis, and produces a variety of interesting bioactive compounds, including vasoactive peptides, growth factors, and cytokines.

The normally clear fluid that collects within the amniotic cavity increases in quantity as pregnancy progresses until near term, when there is a decrease in amniotic fluid volume in many normal pregnancies. An average volume of about 1000 mL is found at term, although this may vary widely from a few milliliters to

many liters in abnormal conditions (oligohydramnios and polyhydramnios).

Oligohydramnios is a condition in pregnancy characterized by a deficiency of amniotic fluid. It is the opposite of polyhydramnios.

### 3. Functions of the amniotic fluid. Polyhydramnios and oligohydramnios.

present from the formation of the gestational sac

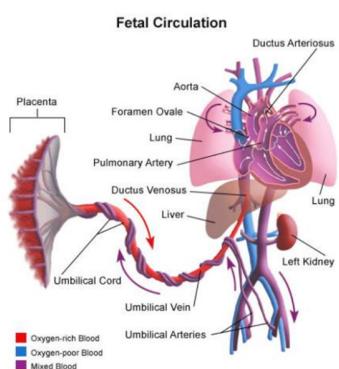
is generated from maternal plasma, passes through the fetal membranes by osmotic and hydrostatic forces

when fetal kidneys begin to function in about week 16, fetal urine also contributes to the fluid

is absorbed through the fetal tissue and skin

after the 20th-25th week of pregnancy when the keratinization of an embryo's skin occurs, the fluid is primarily absorbed by the fetal gut.

Oligohydramnios is a condition in pregnancy characterized by a deficiency of amniotic fluid. It is the opposite of polyhydramnios.



### 4. The structure and functions of the umbilical cord and placenta.

#### STRUCTURE AND FUNCTION

The umbilical cord, or funis, extends from the fetal umbilicus to the fetal surface of the placenta or chorionic plate. Its exterior is dull white, moist, and covered by amnion, through which three umbilical vessels may be seen. Its diameter is 0.8 to 2.0 cm, with an average length of 55 cm and a range of 30 to 100 cm. Generally, cord length less than 30 cm is considered abnormally short (Benirschke and Kauffman, 2000). Folding and tortuosity of the vessels, which are longer than the cord itself, frequently create nodulations on the surface, or false knots, which are

essentially varices. The extracellular matrix, which is a specialized connective tissue, consists of Wharton jelly. After fixation, the umbilical vessels appear empty, but more accurately is representative of the situation *in vivo*, when the vessels are not emptied of blood. The two arteries are smaller in diameter than the vein. The mesoderm of the cord, which is of allantoic origin, fuses with that of the amnion.

Blood flows from the umbilical vein by two routes—the ductus venosus, which empties directly into the inferior vena cava, and numerous smaller openings into the fetal hepatic circulation—and then into the inferior vena cava by the hepatic vein. The blood takes the path of least resistance through these alternate routes. Resistance in the ductus venosus is controlled by a sphincter situated at the origin of the ductus at the umbilical recess and innervated by a branch of the vagus nerve.

#### **4. The structure and functions of the umbilical cord and placenta.**

Umbilical cord

is a conduit between the developing embryo or fetus and the placenta.

is physiologically and genetically part of the fetus and normally contains two arteries (the umbilical arteries) and one vein (the umbilical vein), buried within Wharton's jelly. The umbilical vein supplies the fetus with oxygenated, nutrient-rich blood from the placenta. Conversely, the fetal heart pumps deoxygenated, nutrient-depleted blood through the umbilical arteries back to the placenta.

#### **5. Fetal lie, fetal position, attitude, presentation.**

LIE, PRESENTATION, ATTITUDE, AND POSITION

By convention, fetal orientation is described with respect to fetal lie,

presentation, attitude, and position. These can be established clinically by

FETAL LIE

The lie is the relation of the long axis of the fetus to that of the mother, and is either longitudinal or transverse.

Occasionally, the fetal and the maternal axes may cross at a 45-degree angle,

forming an oblique lie, which is unstable and always becomes longitudinal or transverse during the course of labor. Longitudinal lies are present in over 99 percent of labors at term. Predisposing factors for transverse lies include multiparity, placenta previa, hydramnios, and uterine anomalies.

#### FETAL PRESENTATION

The presenting part is that portion of the body of the fetus that is either foremost within the birth canal or in closest proximity to it.

The presenting part can be felt through the cervix on vaginal examination.

The presenting part determines the presentation.

Accordingly, in longitudinal lies, the presenting part is either the fetal head or breech, creating cephalic and breech presentations, respectively.

When the fetus lies with the long axis transversely, the shoulder is the presenting part. Thus, a shoulder presentation is felt through the cervix on vaginal examination.

**CEPHALIC PRESENTATION.** These are classified according to the relation of the head to the body of the fetus. Ordinarily the head is flexed sharply so that the chin is in contact with the thorax. In this circumstance, the occipital fontanel is the presenting part, and such a presentation is usually referred to as a vertex or occiput presentation. Actually, the vertex lies just in front of the occipital fontanel, and the occiput just behind the fontanel. Much less commonly, the fetal neck may be sharply extended so that the occiput and back come in contact and the face is foremost in the birth canal—face presentation. The fetal head may assume a position between these extremes, partially flexed in some cases, with the anterior (large) fontanel, or bregma, presenting (sinciput presentation), or partially extended in other cases, with the brow presenting (brow presentation). These latter two presentations are usually transient. As labor progresses, sinciput and brow presentations are almost always converted into vertex or face presentations by flexion or extension, respectively.

**BREECH PRESENTATION.** When the fetus presents as a breech, there are three general configurations. When the thighs are flexed and the legs extended over the anterior surfaces of the body, this is termed a frank breech presentation. If the thighs are flexed on the abdomen and the legs upon the thighs, this is a complete breech presentation. If one or both feet, or one or both knees, are lowermost, then

there is an incomplete, or footling, breech presentation.

#### FETAL ATTITUDE OR POSTURE

In the later months of pregnancy the fetus assumes a characteristic posture described as attitude or habitus. As a rule, the fetus forms an ovoid mass that corresponds roughly to the shape of the uterine cavity. The fetus becomes folded or bent upon itself in such a manner that the back becomes markedly convex; the head is sharply flexed so that the chin is almost in contact with the chest; the thighs are flexed over the abdomen; the legs are bent at the knees; and the arches of the feet rest upon the anterior surfaces of the legs. In all cephalic presentations, the arms are usually crossed over the thorax or become parallel to the sides, and the umbilical cord lies in the space between them and the lower extremities. This characteristic posture results from the mode of growth of the fetus and its accommodation to the uterine cavity.

Abnormal exceptions to this attitude occur as the fetal head becomes progressively more extended from the vertex to the face presentation. This results in a progressive change in fetal attitude from a convex (flexed) to a concave (extended) contour of the vertebral column.

#### FETAL POSITION

Position refers to the relation of an arbitrarily chosen portion of the fetal presenting part to the right or left side of the maternal birth canal. Accordingly, with each presentation there may be two positions, right or left. The fetal occiput, chin (mentum), and sacrum are the determining points in vertex, face, and breech presentations, respectively.

#### 5. Fetal lie, fetal position, attitude, presentation.

##### Lie

The lie refers to the relationship of the longitudinal axis of the fetus to long axis of maternal spine.

##### Lie –

- 1.Vertical or Longitudinal(99.5%)
- 2.Transverse
- 3.Oblique

**Longitudinal:-**

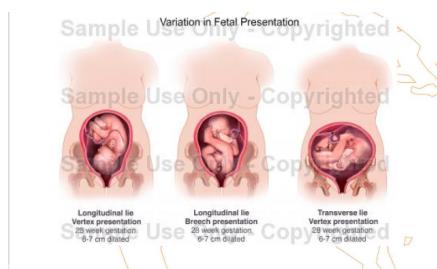
when long axis of the foetus corresponds to the long axis of the mother. E.g.: in cephalic and breech presentation.

**Transverse:-**

When the long axis of the fetus is perpendicular( 90°) to long axis of mother. e.g.: in shoulder presentation

**Oblique:-**

When the long axis of fetus crosses the maternal long axis obliquely at an angle other than right angle.



#### **Presentation**

The part of the fetus which occupies the lower pole of the uterus/birth canal/ maternal pelvis is called presentation of the fetus.

The presentation may be-

1.Cephalic presentation-96.5%

2.Breech presentation or podalic-3%

3.Shoulder presentation-0.5%

4.Compound presentation.

when 2 or more part of baby comes in to lower segment of uterus, it is called compound presentation

#### **Attitude**

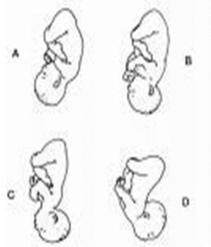
The relation of the different parts (head and body) of the fetus to one another is called attitude of the fetus.

The universal attitude is flexion.

Flexed

Deflexed

Extended



#### Denominator

Denominator:- It is an arbitrary fixed bony point at the presenting part which come in relation with the various quadrants of the maternal pelvis.

Occiput O

Sacrum S

Mentum M

Frontal F

Acromion AC

PRESENTATION	ATTITUDE	DENOMINATOR
Vertex	Flexed	Occiput
Brow	Deflexed	Frontal
Face	Extended	Mentum
Breech		Sacrum
Shoulder		Acromion/ Scapula

It is the relation of the denominator to the different quadrants of the maternal pelvis.

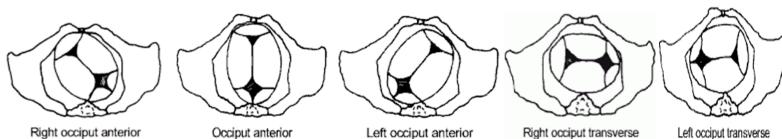
The pelvis id divided in the equal segments of 45° i.e. it is divided into 8 parts. The positions are-

DOA DOP

LOA ROA

LOT ROT

LOP ROP



#### 6. The anatomical features of the fetal head, sutures, fontanelles and its

diameters.

#### 1. Cephalic presentation :-

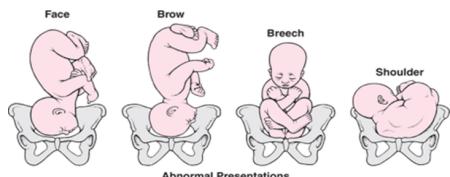
when fetal head occupies the lower segment of uterus, it is called cephalic presentation.

Depending up on degree of flexion or extension, cephalic presentation may be:-

Vertex presentation

Brow presentation

Face presentation



A. Vertex:-It is the quadrangular area bounded anteriorly by the bregma (anterior fontanelle) and coronal sutures behind by the lambda (posterior fontanelle) and the lambdoid sutures and laterally by the line passing through the parietal eminences.

B. Brow:-It is an area bounded on one side by the anterior fontanelle and the coronal sutures and on the other side by the root of the nose and supra-orbital ridges of the either side.

C. Face:- It is an area bounded on one side by the root of the nose and the supra-orbital ridges and on the other by the (chin) junction of the floor of mouth with neck.

In Face presentation- 6 position

#### 1. Mento- anterior:-

Right

Left

Direct

#### 2. Mento- posterior:-

Right

Left

Direct

Engagement

Engagement means maximum transverse diameter of the presenting part passes through the pelvic brim.

For head bi-parietal diameter.

For breech bi-trochanteric diameter.

This is usually done by dividing the head into "fifths"

if the head is still palpable abdominally, it is "2/5" or less engaged

A fontanelle (or fontanell) (colloquially, soft spot) is an anatomical feature of the infant human skull comprising any of the soft membranous gaps (sutures) between the cranial bones that make up the calvaria of a fetus or an infant. Fontanelles allow for rapid stretching and deformation of the neurocranium as the brain expands faster than the surrounding bone can grow. Premature complete ossification of the sutures is called craniostenosis.

The skull of a baby consists of five main bones: two frontal bones, two parietal bones, and one occipital bone. These are joined by fibrous sutures, which allow movement that facilitates childbirth and brain growth.

Posterior fontanelle is triangle-shaped. It lies at the junction between the sagittal suture and lambdoid suture. At birth, the skull features a small posterior fontanelle with an open area covered by a tough membrane, where the two parietal bones adjoin the occipital bone (at the lambda). The posterior fontanelles ossify within 6–8 months after birth. This is called intramembranous ossification. The mesenchymal connective tissue turns into bone tissue.

Anterior fontanelle is a diamond-shaped membrane-filled space located between the two frontal and two parietal bones of the developing fetal skull. It persists until approximately 18 months after birth. It is at the junction of the coronal suture and sagittal suture. The fetal anterior fontanelle may be palpated until 18 months. In cleidocranial dysostosis, however, it is often late in closing at 8–24 months or may never close. Examination of an infant includes palpating the anterior fontanelle.

Two smaller fontanelles are located on each side of the head, more anteriorly the sphenoidal or anterolateral fontanelle (between the sphenoid, parietal, temporal, and frontal bones) and more posteriorly the mastoid or posterolateral fontanelle (between the temporal, occipital, and parietal bones).

During birth, fontanelles enable the bony plates of the skull to flex, allowing the child's head to pass through the birth canal. The ossification of the bones of the skull causes the anterior fontanelle to close over by 9 to 18 months. The sphenoidal and posterior fontanelles close during the first few months of life. The closures eventually form the sutures of the neurocranium. Other than the anterior and posterior fontanelles, the mastoid fontanelle and the sphenoidal fontanelle are also significant.

## 6. The anatomical features of the fetal head, sutures, fontanelles and its diameters.

It is customary to measure certain critical diameters and circumferences of the newborn head. The diameters most frequently used, and the average lengths thereof, are:

The occipitofrontal (11.5 cm), which follows a line extending from a point just above the root of the nose to the most prominent portion of the occipital bone.

The biparietal (9.5 cm), the greatest transverse diameter of the head, which extends from one parietal boss to the other.

The bitemporal (8.0 cm), the greatest distance between the two temporal sutures.

The occipitomental (12.5 cm), from the chin to the most prominent portion of the occiput.

The suboccipitobregmatic (9.5 cm), which follows a line drawn from the middle of the large fontanel to the undersurface of the occipital bone just where it joins the neck.

A fontanelle (or fontanel) (colloquially, soft spot) is an anatomical feature of the infant human skull comprising any of the soft membranous gaps (sutures) between the cranial bones that make up the calvaria of a fetus or an infant. Fontanelles allow for rapid stretching and deformation of the neurocranium as the brain expands faster than the surrounding bone can grow. Premature complete ossification of the sutures is called craniosynostosis.

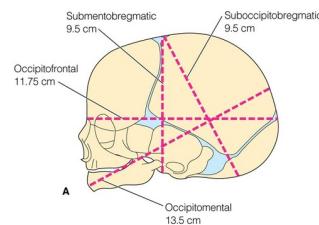
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## 7. The structure, blood supply and innervation of the external and internal

### female genitalia

#### PUDENDUM

The vulva consists of:

the mons pubis,  
the labia majora,  
the labia minora,  
the clitoris  
the glandular structures

that open into the  
vestibulum vaginae

#### PUDENDUM

The size, shape, and coloration of the various structures, as well as the hair distribution, vary between individuals and racial groups. Normal pubic hair in the female is distributed in an inverted triangle, with the base centered over the mons pubis. Nevertheless, in approximately 25% of normal women, hair may extend upward along the linea alba. The length and size of the various structures of the vulva are influenced by the pelvic architecture, as is also the position of the external genitalia in the perineal area. The external genitalia of the female have their exact counterparts in the male.

#### Labia Majora

##### Superficial Anatomy:

The labia majora are comprised of 2 rounded mounds of tissue, originating in the mons pubis and terminating in the perineum.

They form the lateral boundaries of the vulva and are approximately 7-9 cm long and 2-4 cm wide, varying in size with height, weight, race, age, parity, and pelvic architecture.

Ontogenetically, these permanent folds of skin are homologous to the scrotum of the male.

Hair is distributed over their surfaces, extending superiorly in the area of the mons pubis from one side to the other. The medial surfaces of the labia majora may oppose each other directly or may be separated by protrusion of the labia minora.

The cleft that is formed by this opposition anteriorly is termed the anterior commissure. Posteriorly, the cleft is less clearly defined and termed the posterior commissure. The middle portion of the cleft between the 2 labia is the rima pudendi.

##### Arteries:

The arterial supply into the labia majora comes from the internal and external pudendals, with extensive anastomoses. Within the labia majora is a circular arterial pattern originating inferiorly from a branch of the perineal artery, from the external pudendal artery in the anterior lateral aspect, and from a small artery of the ligamentum teres uteri superiorly.

The inferior branch from the perineal artery, which originates from the internal pudendal as it emerges from the canalis pudendalis (Alcock's canal), forms the base of the rete with the external pudendal arteries.

#### Labia Minora

#### Superficial Anatomy:

The labia minora are 2 folds of skin that lie within the rima pudendi and measure approximately 5 cm in length and 0.5-1 cm in thickness.

The width varies according to age and parity, measuring 2-3 cm at its narrowest diameter to 5-6 cm at its widest, with multiple corrugations over the surface.

The labia minora begin at the base of the clitoris, where fusion of the labia is continuous with the prepuce, extending posteriorly and medially to the labia majora at the posterior commissure.

On their medial aspects superiorly beneath the clitoris, they unite to form the frenulum adjacent to the urethra and vagina, terminating along the hymen on the right and left sides of the fossa navicularis and ending posteriorly in the frenulum of the labia pudendi, just superior to the posterior commissure. A deep cleft is formed on the lateral surface between the labium majus and the labium minus.

The skin on the labia minora is smooth and pigmented. The color and distention vary, depending on the level of sexual excitement and the pigmentation of the individual. The glands of the labia are homologous to the glandulae preputiales (glands of Littré) of the penile portion of the male urethra.

#### Arteries:

The main source of arterial supply occurs through anastomoses from the superficial perineal artery, branching from the dorsal artery of the clitoris, and from the medial aspect of the rete of the labia majora.

#### Clitoris

##### Superficial Anatomy:

Crus of clitoris (2)

Body of clitoris

Glans of clitoris

Frenulum of clitoris

Prepuce of clitoris

Corpus cavernosum of clitoris (right/left)

Septum of corpora cavernosa

Fascia of clitoris

#### Arteries:

The blood supply to the clitoris is from its dorsal artery, a terminal branch of the internal pudendal artery, which is the terminal division of the posterior portion of the internal iliac (hypogastric) artery. As it enters the clitoris, it divides into 2 branches, the deep and dorsal arteries.

#### Vestibule

##### Superficial Anatomy:

The area of the vestibule is bordered by the labia minor laterally, by the frenulum labiorum pudendi (or posterior commissure) posteriorly, and by the urethra and clitoris anteriorly. Inferiorly, it is bordered by the hymenal ring. The opening of the vagina or junction of the vagina with the vestibule is limited by a membrane stretching from the posterior and lateral sides to the inferior surface of the external urethral orifice.

#### Arteries:

The blood supply to the vestibule is an extensive capillary plexus that has anastomoses with the superficial transverse perineal artery. A branch comes directly from the pudendal anastomosis with the inferior hemorrhoidal artery in the region of the fossa navicularis; the blood supply of the urethra anteriorly, a branch of the dorsal artery of the clitoris and the azygos artery of the anterior vaginal wall, also contributes.

#### Vestibular Glands

The glandulae vestibulares majores (larger vestibular glands or Bartholin glands) have a duct measuring approximately 5 mm in diameter. The gland itself lies just inferior and lateral to the bulbocavernosus muscle.

The arterial supply to the greater vestibular gland comes from a small branch of the artery on the bulbocavernosus muscle, penetrating deep into its substance.

The greater vestibular gland is homologous to the bulbourethral gland (also known as Cowper's glands, Duverney's glands, Tiedemann's glands, or the Bartholin glands of the male).

### UTERUS

#### Anatomy

The uterus is consist:

fundus of uterus

body of uterus

right/left border of uterus

uterine cavity

isthmus of uterus

cervix of uterus

supravaginal part

vaginal part

external of uterus

#### Ligaments

Although the cervix of the uterus is fixed, the body is free to rise and fall with the filling and emptying of the bladder.

The so-called ligaments supporting the uterus consist of the uterosacral ligaments, the transverse ligaments of the cervix (cardinal ligaments, cardinal supports, ligamentum transversum colli, ligaments of Mackenrodt), the round ligaments, and the broad ligaments.

The cervix is embedded in tissue called the parametrium, containing various amounts of smooth muscle.

#### Layers of Uterine Wall

The wall of the uterus is very thick and consists of 3 layers;  
serous,  
muscular,  
mucous.

The serous layer is simply the peritoneal covering. It is thin and firmly adherent over the fundus and most of the body, then thickens posteriorly and becomes separated from the muscle by the parametrium.

The muscular layer (myometrium) is extremely thick and continuous with that of the tubes and vagina. It also extends into the ovarian and round ligaments, into the cardinal ligaments at the cervix, and minimally into the uterosacral ligaments.

The mucous layer (endometrium) is soft and spongy, composed of tissue resembling embryonic connective tissue. The surface consists of a single layer of ciliated columnar epithelium. The tissue is rather delicate and friable and contains many tubular glands that open into the cavity of the uterus

#### Arteries

The blood supply to the uterus is from the uterine and ovarian arteries. As a terminal branch of the hypogastric artery, the uterine artery runs downward and medially to cross the ureter near the cervix. It then ascends along the lateral border of the uterus in a tortuous course through the parametrium, giving off lateral branches to both uterine surfaces.

- 1 - aorta abdominalis;
- 2 - a. mesenterica inferior;
- 3 - a. iliaca communis;
- 4 - a. iliaca externa;
- 5 - a. iliaca interna;
- 6 - a. glutea superior;
- 7 - a. glutea inferior;
- 8 - a. uterina;
- 9 - a. umbilicalis;
- 10 - aa. vesicales;

- 11 - a. vaginalis;
- 12 - a. pudenda interna;
- 13 - a. perinealis;
- 14 - a. rectalis inferior;
- 15 - a. clitoridis;
- 16 - a. rectalis media;
- 17 - a. uterina;
- 18 - r. tubarius;
- 19 - r. ovaricus;
- 20 - a. ovarica;
- 21 - a. sacralis mediana.

Above, it anastomoses to join with the ovarian artery in the mesometrium, which creates the main accessory source of blood.

The uterine arteries within the uterus form a series of arches over the fundus, creating cruciate anastomoses with the opposite side.

#### UTERINE (FALLOPIAN) TUBES

Parts of tubes

Abdominal ostium

Infundibulum

Fimbriae

Ampulla

Isthmus

Uterine part

#### Layers of Wall of Tubes

Serosa

Subserosa

Muscular layer

Mucosa

#### Ligament of Tube

The infundibulum is suspended from the pelvic brim by the infundibulopelvic ligament (suspensory ligament of the ovary).

#### Arteries & Veins

The blood supply to the tubes is derived from the ovarian and uterine arteries.

The tubal branch of the uterine artery courses along the lower surface of the uterine tube as far as the fimbriated extremity and may also send a branch to the ligamentum teres.

The ovarian branch of the uterine artery runs along the attached border of the ovary and gives off a tubal branch. Both branches form cruciate anastomoses in the mesosalpinx. The veins accompany the arteries.

## OVARIES

### Anatomy

The ovaries are paired organs situated close to the wall on either side of the pelvis minor, a little below the brim. Each measures 2.5-5 cm in length, 1.5-3 cm in breadth, and 0.7-1.5 cm in width, weighing about 4-8 g.

#### Parts of the ovary

Hilum of ovary

Medial surface

Lateral surface

Free border

Mesovarian border

Tubal extremity

Uterine extremity

Mesovarium

The ovary is suspended by means of the mesovarium, the suspensory ligament of the ovary, and the ovarian ligament.

### STRUCTURES OF OVARY

The ovary consists of a cortex and a medulla

#### Arteries

The ovarian artery is the chief source of blood for the ovary. Though both arteries may originate as branches of the abdominal aorta, the left frequently originates from the left renal artery. An additional blood supply is formed from anastomosis with the ovarian branch of the uterine artery, which courses along the attached border of the ovary.

#### VAGINA

The vagina is a strong canal of muscle approximately 7.5 cm long that extends from the uterus to the vestibule of the external genitalia, where it opens to the exterior

Because the cervix of the uterus projects into the upper portion, the anterior wall of the vagina is 1.5-2 cm shorter than the posterior wall.

The circular culdesac formed around the cervix is known as the fornix and is divided into 4 regions;

the anterior part,

the posterior part,

2 lateral parts.

#### Wall Structure

The vaginal wall is composed of a mucosal and a muscular layer. The smooth muscle fibers are indistinctly arranged in 3 layers:

an outer longitudinal layer,

circumferential layer,

a poorly differentiated inner longitudinal layer.

#### Arteries & Veins

Vaginal (of uterine artery) branches

Vaginal artery

Inferior vesical artery

Middle rectal artery

Posterior labial branches

The veins follow the course of the arteries.

#### NERVES

Pelvic parasympathetic nerves ascending

Superior hypogastric plexus

Left hypogastric nerve

Sacral splanchnic nerve

Pudendal nerve

Sympathetic fibres descending from T11, 12

Pelvic splanchnic nerve (Para)

Inferior hypogastric plexus

#### 7. The structure, blood supply and innervation of the external and internal female genitalia.

External female genitalia are a part of the female reproductive system, and include: mons pubis, labia majora, labia minora, clitoris, vestibule, hymen, vestibular bulb and vestibular glands.

Components of the external female genitalia occupy a large part of the female perineum and together they are called the vulva. The functions of the external female genitalia are many, such as reproduction and sexual pleasure, parturition and the protection of the internal genital organs.

External genitalia of a female occupy much of the perineum and are collectively referred to as the vulva (pudendum).

#### Mons Pubis

The mons pubis consists of a mass of subcutaneous adipose tissue anterior to the pubic symphysis, and bears most of the pubic hair.

#### Labia Majora

The labia majora (singular, labium majus) are a pair of thick folds of skin and adipose tissue found inferior to the mons. The fissure between the folds is called the pudendal cleft. Pubic hair can be found on the lateral surfaces of the labia majora once puberty hits, while the medial/internal surfaces will remain hairless. The round ligament of the uterus passes through the inguinal canal and continues into the labia majora, where the nerve fibers spread and mix with the tissue of the mons pubis. The labia majora are thicker in the front where they form by joining the anterior commissure, and is found below the mons pubis. The posterior commissure of the labia majora is the rear joining of the labia majora, and is located above the perineum.

#### Labia Minora

Found medial to the labia majora are the labia minora (singular, labium minus), which are much thinner devoid of fat and entirely hairless. Their frontal ends split to form upper and lower layers. The upper layer goes superior to the clitoris and forms a fold called prepuce. The lower layer passes inferior to clitoris and forms the frenulum of the clitoris.

#### Clitoris

The clitoris is analogous to the structure of the penis but it does not contain urethra and has no urinary role. It is richly supplied with autonomic efferent motor nerve endings via the cavernosal nerve of the clitoris and is highly sensitive to sexual stimulation. Also unlike the penis, the clitoris is nearly entirely internal and does not have a corpus spongiosum or enclose the urethra.

The clitoris has a pair of corpora cavernosa which consist of erectile tissue enclosed in dense fibrous tissue. Each corpus (body) passes internally, and is attached to the ischiopubic ramus by a crus. The suspensory ligament and two small muscles (ischiocavernosi) are attached to the crura just like the penis. The glans (head) of the clitoris is a small tubercle, which protrudes slightly from the prepuce. Arteries here include the dorsal and clitoral cavernosal arteries, which arise from the iliohypogastric pudendal bed.

#### Vestibule

The labia minora enclose an area called the vestibule, which contains the urinary and vaginal orifices along with the openings of the greater and lesser vestibular glands. The prepuce is found at the anterior margin of the vestibule.

#### Hymen

Most females (but not all) are born with a hymen, which is generally in the form of an elliptical/oval-shaped membranous ring around the vaginal orifice (It is generally perforated to some degree, most often in the centre, kind of like a 'donut' shape). The remnants of this membranous ring in adult females is known as hymenal caruncles, which appear as small thin elevations of mucous membrane around the vaginal opening. When the hymen completely covers the vaginal orifice, it is known as an

**imperforate hymen.** An imperforate hymen may rupture naturally during various types of physical activity (aside from intercourse).

Some females may undergo a hymenotomy, which involves the surgical removal, or opening of the hymen, most often to facilitate menstruation, or relieve discomfort during intercourse. This procedure may also be undertaken in the instance when the hymen is abnormally thick, and/or when the opening is small, limiting access to the vaginal orifice.

#### Vestibular Bulbs

Vestibular bulbs are located on each side of the vestibule. They consist of a pair of subcutaneous erectile tissues which correspond to the penile bulb and corpus spongiosum. Both bulbs join in front of urethral orifices under the vestibule of the vagina. Each one is covered with bulbospongiosus muscles.

#### Vestibular Glands

Bartholin's (greater vestibular) glands are pea-sized with a short duct that opens into the vestibule or lower vagina. One is found on each side of the vagina.

Bartholin's glands are homologous to the bulbourethral glands in the male, and function to keep the vulva moist, providing lubrication for sexual intercourse during sexual excitement. Additionally, lesser vestibular glands lubricate the vestibule. Finally, a pair of Skene's (paraurethral) glands, homologous to the male prostate, open into the vestibule nears the external urethral orifice.

#### Blood Supply

Vasculation of the external female genitalia is primarily supplied by the internal pudendal arteries, which are branches of the anterior division of the internal iliac artery.

#### Lymphatic Drainage

Lymphatic drainage of the external female genitalia is via the superficial and deep inguinal lymph nodes. Lymph from the clitoris, vestibular bulb and anterior labia minora can alternatively drain into the internal iliac lymph nodes.

#### Innervation

The vulva is innervated from a variety of sources. The mons pubis and anterior labia is innervated via the anterior labial nerves, which derive from the lumbar plexus. The posterior aspect of the vulva is innervated via the pudendal nerve and its branches (posterior labial nerves), together with branches from the posterior cutaneous nerve of the thigh. Sensitive innervation to the clitoris is provided by the dorsal nerve of the clitoris.

The internal genital organs form a pathway (the genital tract). This pathway consists of the following:

Vagina (part of the birth canal), where sperm are deposited and from which a baby can emerge

Uterus, where an embryo can develop into a fetus

Fallopian tubes (oviducts), where a sperm can fertilize an egg

Ovaries, which produce and release eggs

Sperm can travel up the tract, and eggs down the tract.

Vagina: The vagina is a canal that joins the cervix (the lower part of uterus) to the outside of the body. It also is known as the birth canal.

Uterus (womb): The uterus is a hollow, pear-shaped organ that is the home to a developing fetus. The uterus is divided into two parts: the cervix, which is the lower part that opens into the vagina, and the main body of the uterus, called the corpus. The corpus can easily expand to hold a developing baby. A channel through the cervix allows sperm to enter and menstrual blood to exit.

Ovaries: The ovaries are small, oval-shaped glands that are located on either side of the uterus. The ovaries produce eggs and hormones.

Fallopian tubes: These are narrow tubes that are attached to the upper part of the uterus and serve as tunnels for the ova (egg cells) to travel from the ovaries to the uterus. Conception, the fertilization of an egg by a sperm, normally occurs in the fallopian tubes. The fertilized egg then moves to the uterus, where it implants into the lining of the uterine wall.

Paired branches of the abdominal aorta, called the ovarian arteries, supply blood to the reproductive organs, such as the ovaries, fallopian tubes, and uterus.

Veins are the blood vessels that return oxygen-depleted blood back to the heart for reuse. They typically follow the same path as arteries. Similar to the arteries in the pelvis, veins branch within the legs. As blood returns to the heart these branches — the external iliac veins — feed into the inferior vena cava, the large vessel that runs parallel to the abdominal aorta.

#### NERVES

Pelvic parasympathetic nerves ascending ,Superior hypogastric plexus ,Left hypogastric nerve,

Sacral splanchnic nerve ,Pudendal nerve ,Sympathetic fibres descending from T11, 12

Pelvic splanchnic nerve (Para),Inferior hypogastric plexus

#### Uterine Support

Uterine support thought to be by:

Ligaments: - from the uterus to the pelvic walls

Pubocervical

Transverse cervical (cardinal ligament)

Uterosacral

Perineal membrane

Pelvic floor (especially levator ani)

Perineal body

Vascular Supply

Ovarian artery :

-originates from L2 as a branch of the abdominal aorta.

Lymphatic drainage mainly follows the arterial supply and venous drainage

by passing backwards through the nodes around the branches of the iliac arteries and abdominal aorta.

Lymph from the scrotum and penile skin or labia and the distal part of the vagina drain into the superficial inguinal nodes.

#### **8. The perineum and pelvic floor: the structure and blood supply.**

Pelvis

The female bony pelvis is divided into:

- False pelvis: above the pelvic brim; has no obstetric importance.
- True pelvis: below the pelvic brim; related to the childbirth.

THE TRUE PELVIS is composed of inlet, cavity, and outlet.

Hip bone formed from 3 bones

Ilium

Pubic

Ischium

Fuse in late puberty

Bones fuse at acetabulum

**PELVIC INLET (BRIM)**

Sacral promontory,

alae of the sacrum,

sacroiliac joints,

iliopectineal lines,

iliopectineal eminencies,

upper border of the superior pubic rami,

pubic tubercles,

pubic crests and

upper border of symphysis pubis.

Pelvic Inlet:

S1

Rim of pelvic bone

Pubic symphysis

Pelvic Outlet:

Coccyx and sacrum

Inferior margin of pelvic bone

Ischial tuberosity

Sacrotuberous ligament

Pubic symphysis

#### FEMALE PELVIS

Cavity is broad, shallow ,Pelvic inlet oval + outlet round ,Bones are lighter, thinner ,Pubic angle larger

Coccyx more flexible, straighter ,Ischial tuberosities shorter, more everted

Antero-posterior Brim diameters

Anatomical anterior-posterior diameter

1. (true conjugate) =11cm- From the tip of the sacral promontory upper border of the symphysis pubis.

2. Obstetric conjugate = 10.5 cm - from the tip of the sacral promontory to the most bulging point on the back of symphysis pubis which is about 1 cm below its upper border. It is the shortest antero-posterior diameter.

Diagonal conjugate = 12.5 cm i. e. 1.5 cm longer than the true conjugate.

From the tip of sacral promontory to the lower border of symphysis pubis.

4. External conjugate = 20 cm

from the depression below the last lumbar spine to the upper anterior margin of the symphysis pubis measured from outside by the pelvimeter . It does not have a real obstetric importance.

Transverse brim diameters

1. Anatomical transverse diameter =13cm

between the farthest two points on the iliopectineal lines.

It lies 4 cm anterior to the promontory and 7 cm behind the symphysis.

It is the largest diameter in the pelvis.

2. Obstetric transverse diameter:

It bisects the true conjugate and is slightly shorter than the anatomical transverse diameter.

Oblique brim diameters

1. Right oblique diameter =12 cm

from the right sacroiliac joint to the left iliopectineal eminence.

2. Left oblique diameter = 12 cm

from the left sacroiliac joint to the right iliopectineal eminence.

3. Sacro-cotyloid diameters = 9-9.5 cm

from the promontory of the sacrum to the right and left iliopectineal eminence, so the right diameter ends at the right eminence and vice versa.

#### Pelvic cavity

It is a segment, the boundaries of which are:

the roof is the plane of pelvic brim, the floor is the plane of least pelvic dimension,

anteriorly the shorter symphysis pubis, posteriorly the longer sacrum.

#### The Pelvic Floor

Musculotendinous hammock or sling

Termination of the pelvic outlet

Muscles of the pelvis

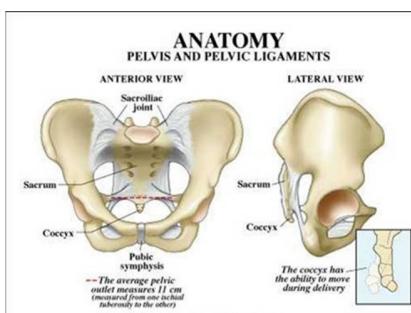
Anal sphincter complex

Levator ani muscles

Support the abdominal and pelvic organs

Connect the pelvis to the vertebral column

Maintain continence

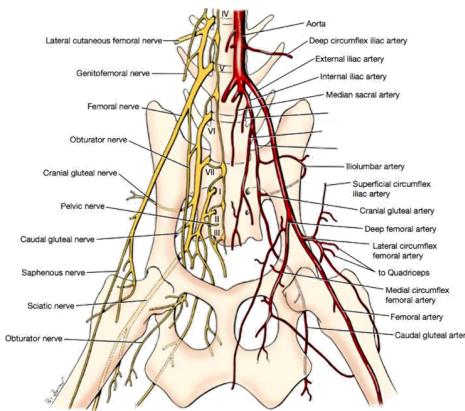


#### The Function of Pelvic Floor

Support pelvic and abdominal organs during stress of increased abdominal pressure

Allow for opening of the pelvic floor to accommodate excretory functions and parturition

Endopelvic fascia and visceral ligaments contains smooth muscles



## 9. Physiological Changes during pregnancy.

**Signs of pregnancy**

**Presumptive:** amenorrhea, nausea, breast tenderness, vomiting, skin pigmentation.

**Probable:** uterus enlargement, uterine contractions or “fetal movement”, positive b-HCG test.

**Positive:** sonographic visualization, fetal heart tones.

**Normal pregnancy events**

Normal longitude: 259 – 294 days (37 – 42 weeks)

Three trimesters:

0 – 13 weeks

13 – 26 weeks

26 – 40 weeks

Birth earlier than 259 days – preterm delivery

Birth later than 294 days – protracted pregnancy

**cardiovascular changes in normal pregnancy**

blood volume increases by 40-50%

increase in heart rate (15 beats/min more than usual), stroke volume, and cardiac output by about 50%, mostly during the first trimester

the systemic vascular resistance slightly decreases

diastolic blood pressure decreases between 12–26 weeks, and increases again to pre-pregnancy levels by 36 weeks

**Haematologic changes**

Plasma volume increases by 40-50%

Erythrocyte quantity increases by 30%

Hematocrit and hemoglobin decrease by 15% (physiological HAEMODILUTION)

Erythrocyte sedimentation rate increases

Leukocyte quantity increases up to  $16 \times 10^9$

**HYPEROAGULATION** (coagulation factors increase)

Gastric motility decreases

Colonic motility decreases

Constipations are common

**RESPIRATORY CHANGES**

Tidal volume increases

Minute ventilation increases

Residual volume decreases

**RESPIRATORY ALCALOSIS** Strointestinal changes

**RENAL CHANGES**

Kidneys increase in size

Ureters are dilated

Glomerular filtration rate increases by 50%

Glycosuria is common

Proteinuria is PATHOLOGIC

Endocrine changes

Pituitary increases by 100%

Adrenals stay the same size, but cortisol production increases two- to threefold

Thyroid increases by 15%

Free T3 and T4 remain unchanged

#### **10. Diagnosis of pregnancy in the first trimester.**

First Trimester for Parents

Find out what tests may be offered to you during the first trimester of pregnancy

After the first visit, you can expect to get your urine tested and your weight and blood pressure checked at every (or almost every) visit until you deliver. These tests can find problems such as gestational diabetes and preeclampsia (dangerously high blood pressure).

During your first trimester, you'll be offered more tests depending on your age, health, family medical history, and other things. These can include:

**First trimester screening:** This test includes a blood test and an ultrasound exam. It helps to determine whether the fetus is at risk for a chromosomal abnormality (such as Down syndrome) or birth defects (such as heart problems).

**Ultrasound:** This safe and painless test uses sound waves to make images that show the baby's shape and position. It can be done early in the first trimester to date the pregnancy or during weeks 11–14 as part of the first trimester screening. Women with high-risk pregnancies might have multiple ultrasounds during their first trimester.

**Chorionic villus sampling (CVS):** This test checks cells from the placenta to see if they have a chromosomal abnormality (such as Down syndrome). It can be done from weeks 10 to 13, and can tell for sure if a baby will be born with a specific chromosomal disorder.

**Cell-free DNA testing:** This blood test checks for fetal DNA in the mother's blood. It's done to see whether the fetus is at risk for a chromosomal disorder, and can be done from 10 weeks on. It is not a diagnostic test. If the results are abnormal, another test must confirm or rule out the diagnosis. It's usually offered to pregnant women at higher risk because they're older or have had a baby with a chromosomal abnormality.

#### What Other Tests Might Be Offered?

Health care providers might order other tests during a woman's pregnancy based on such things as her (and her partner's) personal medical history and risk factors. It's important to speak with a genetic counselor if your baby is at risk for hereditary conditions.

Screening or diagnostic tests offered include tests for:

thyroid disease

toxoplasmosis

hepatitis C

cytomegalovirus (CMV)

Tay-Sachs disease

fragile X syndrome

tuberculosis

Canavan disease

#### **11. Diagnosis of pregnancy in the second and third trimesters.**

##### Second Trimester for Parents

Find out what tests may be offered to you during weeks 13 through 26 of pregnancy.

Throughout your second trimester, you'll be offered more tests depending on your age, health, family medical history, and other things. These can include:

**Multiple marker test:** This blood test is done between weeks 15 and 20 to screen for neural tube defects (such as spina bifida) and chromosomal disorders (such as Down syndrome and trisomy 18). Test results can be combined with first trimester screening tests to give more accurate results (this is called an integrated screening test).

**Ultrasound:** An ultrasound is a safe and painless test that uses sound waves to make images that show the baby's shape and position in the uterus. Most second-trimester ultrasounds, or "level 2" ultrasounds, are done between 18–20 weeks to examine the baby's anatomy and confirm that the baby is developing normally. Women with high-risk pregnancies may have multiple ultrasounds in their second trimester.

**Glucose screening:** This test checks for gestational diabetes, a short-term form of diabetes that develops in some women during pregnancy and can cause health problems for the baby, especially if it is not diagnosed or treated. You'll drink a sugary liquid, then have a blood test an hour later to check glucose levels. It's usually done at 24 to 28 weeks, but can be earlier if a woman is at higher risk for gestational diabetes.

**Amniocentesis:** This test takes a sample of the amniotic fluid that surrounds a baby to check for signs of problems such as chromosomal disorders, genetic problems, and neural tube defects. It's usually done between 15 and 20 weeks in women who are considered at higher risk of having a baby with these disorders.

**Percutaneous umbilical blood sampling (PUBS):** Also known as cordocentesis, fetal blood sampling, or umbilical vein sampling, this quick test examines fetal blood directly from the umbilical cord to detect disorders in the fetus. It's usually done after 18 weeks of pregnancy. It's not done as often as other diagnostic tests (such as amniocentesis and chorionic villus sampling), but may be used if results from those tests are not conclusive.

#### Third Trimester for Parents

Find out what tests may be offered to you during weeks 27 through 40 of pregnancy.

Throughout your third trimester, you'll be offered more tests depending on your age, health, family medical history, and other things. These can include:

**Ultrasound:** An ultrasound is a safe and painless test that uses sound waves to make images that show the baby's shape and position in the uterus. Third-trimester ultrasounds can examine the placenta, and sometimes are part of a test called a biophysical profile (BPP) to see whether the baby is getting enough oxygen. Women with high-risk pregnancies may have multiple ultrasounds in their third trimester.

**Glucose screening:** This test checks for gestational diabetes, a short-term form of diabetes that develops in some women during pregnancy and can cause health problems for the baby, especially if it is not diagnosed or treated. You'll drink a sugary liquid, then have a blood test an hour later to check glucose levels.

**Group B strep test:** Between your 35th and 37th weeks of pregnancy, the doctor will check you for group B streptococcus (GBS) infection. GBS bacteria are found naturally in the vaginas of many women but can cause serious infections in newborns. This test involves swabbing the vagina and rectum. A woman whose test comes back positive must go to the hospital as soon as labor begins so that intravenous (IV) antibiotics can be started to help protect the baby from becoming infected.

**Nonstress test:** A nonstress test (NST) is usually done when a health care provider wants to check on the health of the fetus, such as in a high-risk pregnancy or when the due date has passed. The test checks to see if the baby responds normally to stimulation and is getting enough oxygen. A baby that doesn't respond isn't necessarily in danger, but more testing might be needed.

**Contraction stress test:** This test stimulates the uterus with pitocin, a synthetic form of oxytocin (a hormone secreted during childbirth), to determine the effect of contractions on fetal heart rate. It may be recommended when an earlier test indicated a problem and can see whether the baby's heart rate is stable during contractions.

**12. Obstetrics examination: questioning and physical examination, speculum and bimanual examination.**

**Questioning:**

The history-taking should include:

**Case-history:**

Name, surname ,Age ,Marital status,Address

**Gynecological history:**

age when periods began (menarche);

regularity of the cycle;

usual duration of each period;

the duration of the menstrual cycle from the 1st day of one period till the 1st day of the next one.

the number of childbirths; specify the mother's age and child's body mass at birth;

any abnormalities during pregnancy, labor or postpartum period;

the number of miscarriages; specify the stage of pregnancy, date of the miscarriage, and any complications;

any abortions, specifying the stage of pregnancy and the method of abortion.

**Sexual history**

**Contraception**

**Past history**

**Detailed history of present complaint**

**Emotional problems**

#### **Examination of the patient**

##### **Examination of the abdominal wall:**

The patient must lie flat, and if the abdomen is at all rigid she should draw up her knees to relax the muscles. The bladder should be empty.

##### **Inspection:**

The size and shape of the abdomen is noted. Fullness in the midline might indicate a uterine or ovarian tumor; fullness in the flanks may occur with ascites. The condition of the skin, whether showing lineal albicantes, rashes, pigmentation or scars, is observed.

##### **Palpation :**

The abdomen should always be examined with a warm hand and with the flat of the hand rather than the tips of the fingers, as deep palpation can then be done without hurting the patient.

##### **Percussion:**

Percussion enables one to decide whether a swelling is in contact with the abdominal wall and therefore dull on percussion. If the abdomen is resonant in the center and dull in the flanks, and the dullness shifts when the patient changes her position, free fluid can be diagnosed

##### **Auscultation:**

On listening with a stethoscope, bowel sounds are normally present.

#### **Gynecological examination**

##### **Inspection of the external and internal genitalia:**

The presence of the labia hypoplasia, pale and dry mucous membranes of the vagina are the clinical manifestations of hypoestrogenism. Mucosa "saturation", cyanotic color of the vulval mucosa, abundant secretion are clear signs of increased estrogen levels.

##### **Speculum examination:**

To make a visual examination of the vaginal a speculum is employed. Care must be taken to avoid hurting the patient. A sterile lubricant is used and only a small quantity is required.

This should be presented from a tube, so that it cannot become contaminated and cause cross-infection of one patient by another. It should be transparent, so that discharge can be distinguished, and should not contain antiseptics which will interfere with bacteriological examination.

Two forms of specula are in common use: Cusco's bivalve speculum and Sims speculum.

Cusco's or bivalve speculum consists of two blades fixed together by a hinge at the vulval end of the instrument. It gives an excellent view of the cervix and vaginal mucosa, and when screwed open remains steady in the vagina without being held.

Sims' speculum is devised to display vesico-vaginal fistulae. It consists of two concave blades of different sizes, with a handle connecting them.

##### **Bimanual Examination**

The bimanual examination (also known as a pelvic examination) is an examination of the female genital organs.

Use lubricating gel to lubricate the right index finger and middle finger

Ensure the patient is still happy to proceed, and gently insert fingers into the vagina

Enter with the palm facing sideways, then rotate so the palm is facing upwards

In practice, you can use one finger for the whole examination. However, for OSCE/examination purposes, two fingers should be used (unless the presenting complaint is that partner cannot enter / pain during sex).

Move along the posterior wall of the vagina and locate the cervix and feel for:

Smoothness, clots, mobility and firmness

Place fingers in the posterior fornix to lift the uterus whilst simultaneously pushing the fundus down by placing the left hand above the symphysis pubis.

Assess uterus size (a normal uterus is approximately the size of a plum)

Determine if anteverted or retroverted

Note tenderness, mobility and shape

Place the fingers in the lateral fornix and press lateral to the umbilicus to feel for any adnexal tenderness or masses (repeat on the other side)

Gently move the cervix from side to side to check for cervical tenderness (important sign with ectopic pregnancy or pelvic inflammatory disease).

Remove fingers gently and inspect for discharge or blood

### **13. The maneuvers of external obstetric examination (Leopold's maneuvers).**

Leopold's Maneuver

Four-part process

Palpation of fetal position in-utero

Preparation

Woman is supine, head slightly elevated and knees slightly flexed

Place a small rolled towel under her right hip

If the nurse is R handed, stand at the woman's R side facing her for the first 3 steps, then turn and face her feet for the last step (L handed, left side).

#### **First Maneuver**

Facing the mother, palpate the fundus with both hands

Assess for shape, size, consistency and mobility

Fetal head: firm, hard, and round

Moves independently of the rest

Detectable by ballottement

Breech/buttocks: softer and has bony prominences

Moves with the rest of the form

#### **Second Maneuver**

Determine position of the back.

Still facing the mother, place both palms on the abdomen

Hold R hand still and with deep but gentle pressure, use L hand to feel for the firm, smooth back

Repeat using opposite hands

Confirm your findings by palpating the fetal extremities on the opposite side

small protrusions, "lumpy"

#### **Third Maneuver**

Determine what part is lying

above the inlet.

Gently grasp the lower portion of the abdomen (just above symphysis pubis) with the thumb and fingers of the R hand

Confirm presenting part

(opposite of what's in the fundus)

Head will feel firm

Buttocks will feel softer and irregular

If it's not engaged, it may be gently pushed back and forth

Proceed to the 4th step if it's not engaged

#### **Fourth Maneuver**

1)Locate brow.

2)Assess descent of the presenting part.

Turn to face the woman's feet

Move fingers of both hands gently down the sides of the abdomen towards the pubis

- Palpate for the cephalic prominence (vertex)

Fourth Maneuver (cont'd)

Prominence on the same side as the small parts suggests that the head is flexed (optimum)

Prominence on the same side as the back suggests that the head is extended

#### **14. Determination of the term of pregnancy and the date of delivery.**

##### **DETERMINATION OF GESTATIONAL AGE**

Several different terms are used to define the duration of pregnancy, and thus fetal age, but these are somewhat confusing. Gestational age or menstrual age is the time elapsed since the first day of the last menstrual period, a time that actually precedes conception.

Obstetricians customarily calculate gestational age as menstrual age of a given pregnancy. About 280 days, or 40 weeks, elapse on average between the first day of the last menstrual period and the birth of the fetus; 280 days correspond to 9 1/3 calendar months, or 10 units of 28 days each.

A quick estimate of the due date of a pregnancy based on menstrual cycle can be made as follows: add 7 days to the first day of the last menstrual period and subtract 3 months.

The period of gestation can also be divided into three units of three calendar months each or three trimesters, because important obstetrical milestones can be designated conveniently by trimesters. The possibility of spontaneous abortion, for example, is limited principally to the first trimester, whereas the likelihood of survival of the infant born preterm is increased greatly in pregnancies that reach the third trimester.

#### **15. The female pelvis. Measurement of the external size of pelvis.**

The pelvis can be classified into four main types by measuring the pelvic diameters and conjugates at the pelvic inlet and outlet and as oblique diameters.

Pelvic measurements <sup>[7]</sup>			
Measurement	From	To	Length
Transverse diameter (of inlet)	Between extreme lateral points of pelvic inlet		13.5–14 cm
Obligate diameter I	Right sacroiliac joint	Left iliopectic eminence	12–12.5 cm
Obligate diameter II	Left sacroiliac joint	Right iliopectic eminence	11.5–12 cm
Anatomical conjugate (true conjugate)	Pubic symphysis	Promontory	~12 cm
Interspinous distance	Between anterior superior iliac spines		26 cm (female)
Intercristal distance	Between furthest lateral points of iliac crest		29 cm (female)
External conjugate	Spinous process of fifth lumbar vertebra	Upper edge of symphysis	~20 cm
Intertrochanteric distance	Between femurs		31 cm

\*Because the true conjugate can not be measured directly it is derived from the diagonal conjugate which is measured through the vagina.

Obstetric conjugate	Retropubic eminence (posterior surface of symphysis)	Promontory	>10 cm
Diagonal conjugate*	Inferior pubic ligament	Promontory	11.5–12 cm
Straight conjugate	Lower border of symphysis	Tip of coccyx	9.5–10 cm
Median conjugate	Lower border of symphysis	Lower border of sacrum	11.5 cm
Transverse diameter (of outlet)	Between ischial tuberosities		10–11 cm

#### 16. Definition of the true conjugate, Michaelis's rhomb, Soloviov's index.

#### 17. Methods of the fetus condition assessment: cardiotocography.

##### CARDIOTOGOGRAPHY (CTG)

a technical means of recording the fetal heartbeat and the uterine contractions during pregnancy, typically in the third trimester.

the machine used to perform the monitoring is called a cardiotocograph, more commonly known as an electronic fetal monitor (EFM).

normally performed after week 28

can be external and internal

method can only be used if membranes (forewaters) are ruptured either spontaneously or artificially and the cervix is mature.

An electrode is placed on the baby's scalp to directly monitor the fetal heart rate. An electrode is called a fetal scalp electrode (FSE).

To gauge the strength of contractions, a small catheter (intrauterine pressure catheter or IUPC) is placed in the uterus. Combined with an internal fetal monitor, an IUPC may give a more precise reading of the baby's heart rate and the contractions.

##### CTG INTERPRETATION

Uterine activity (contractions)

Baseline fetal heart rate (FHR)

Baseline FHR variability

Presence of accelerations

Periodic or episodic decelerations, Changes or trends of FHR patterns over time

#### Category 1: NORMAL CTG

Tracings with all these findings present are strongly predictive of normal fetal acid-base status at the time of observation and the fetus can be followed in a standard manner:

Baseline rate 110-160 bpm

Moderate variability

Absence of late, or variable decelerations

Early decelerations and accelerations may or may not be present.

#### Category 2: INDETERMINED

Tracing is not predictive of abnormal fetal acid-base status, but evaluation and continued surveillance and reevaluations are indicated.

Bradycardia with normal baseline variability

Tachycardia

Minimal or marked baseline variability of FHR

Accelerations: absence of induced accelerations after fetal stimulation

Periodic or episodic decelerations: Longer than 2min but shorter than 10min; recurrent late decelerations with moderate baseline variability

Variable decelerations with other characteristics such as slow return to baseline, overshoots of "shoulders" seen (humps on either side of deceleration).

#### Category 3: ABNORMAL

Tracing is predictive of abnormal fetal acid-base status at the time of observation; this requires prompt evaluation and management.

Absence of baseline variability with recurrent late or variable decelerations or bradycardia

Sinusoidal fetal heart rate.

CRITERIA	0 POINTS	1 POINT	2 POINTS
BASELINE FHR, bpm	< 100; >180	100-120, 160-180	120-160
VARIABILITY, amplitude	<3	3-5	6-25
VARIABILITY, in 1 minute	<3	3-6	>6
ACCELERATIONS in 30 min	absent	1-4, single or periodic	>5 single
DECCELERATIONS	late or variable	early (serious) or variable (light)	absent or early (light)
FETAL MOVEMENTS	absent	1-2	>3

#### CTG EVALUATION

9-12 POINTS: satisfactory fetal condition .

6-8 POINTS: fetal hypoxia, no threat of death during the period of 24 hours

0-5 POINTS: severe hypoxia, risk of immediate intrauterine death , EMERGENCY DELIVERY

## **18. Methods of the fetus condition assessment: fetal biophysical profile, Doppler assessment.**

A fetal biophysical profile is a prenatal test used to check on a baby's well-being. The test combines fetal heart rate monitoring (nonstress test) and fetal ultrasound to evaluate a baby's heart rate, breathing, movements, muscle tone and amniotic fluid level. The nonstress test and ultrasound measurements are then each given a score based on whether certain criteria are met.

Typically, a biophysical profile is recommended for women at increased risk of problems that could lead to complications or pregnancy loss. The test is usually done after week 32 of pregnancy

The five discrete biophysical variables:

Fetal heart rate

Fetal breathing

Fetal movement

Fetal tone

Amniotic fluid volume

Parameter	Normal (2 points)	Abnormal (0 points)
NST/Reactive FHR	At least two accelerations in 20 minutes	Less than two accelerations to satisfy the test in 20 minutes
US: Fetal breathing movements	At least one episode of > 30s or >20s <sup>[3]</sup> in 30 minutes	None or less than 30s or 20s <sup>[3]</sup>
US: Fetal activity / gross body movements	At least three or two <sup>[3]</sup> movements of the torso or limbs	Less than three or two <sup>[3]</sup> movements
US: Fetal muscle tone	At least one <sup>[3]</sup> episode of active bending and straightening of the limb or trunk	No movements or movements slow and incomplete
US: Qualitative AFV/AFI	At least one vertical pocket > 2 cm in the vertical axis or AFI of 5 cm	Largest vertical pocket </= 2 cm, or AFI </= 5 cm

Doppler ultrasound uses sound waves to detect the movement of blood in vessels. It is used in pregnancy to study blood circulation in the baby, uterus and placenta

To assess the effects on obstetric practice and pregnancy outcome of routine fetal and umbilical Doppler ultrasound in unselected and low-risk pregnancies.

## **19. Ultrasound assessment during pregnancy.**

## **20. Prenatal diagnosis of the fetal genetic anomalies.**

### **CONGENITAL ABNORMALITIES**

5 categories:

- 1 – chromosome (N – 46, XX or 46, XY)
- 2 – single gene abnormalities
- 3 – maternal conditions during pregnancy
- 4 – genetic + environmental causes
- 5 – unknown causes

### **SINGLE GENE ABNORMALITIES**

Autosomal dominant inheritance is a genetic abnormality that can be passed on to the child if one of the parents has the same abnormality.

Autosomal recessive inheritance is a genetic abnormality that can be passed on to the child only if both parents carry the same defective gene.

X-linked conditions are genetic abnormalities that mainly occur in males (e.g. hemophilia, color blindness, forms of muscular dystrophy). Females may carry the abnormal gene that causes X-linked recessive disorders, but they may not show the actual disease.

X-linked dominant conditions occur in both males and females; however, they are more severe in males (e.g. certain neurological conditions affecting the brain, skin disorders and types of skeletal or craniofacial disorders).

## **20. Prenatal diagnosis of the fetal genetic anomalies.**

### **Congenital anomalies and prenatal diagnosis**

Congenital malformations are twice as common in twin pregnancies compared with singletons and 4 times more common in triplets. The rate of congenital anomalies in twins is estimated at approximately 4% compared with 2% in singletons. Monozygotic twins have twice the incidence of congenital abnormalities compared with dizygotic twins. In a cohort of twins with known chronicity, the prevalence of congenital anomalies in monochorionic twins was estimated at approximately 6% compared with 3% for dichorionic twins.

The presence of multiple fetuses increases the mathematical probability of the pregnancy being affected by a chromosomal abnormality. Therefore, the risk of Down syndrome in either fetus of a 33 year old woman with a twin gestation is equivalent to the risk of a 35 year old woman with a singleton pregnancy.

Invasive diagnostic testing in multiple gestations can be technically challenging

due to positioning of the fetuses, possibility of cross-contamination of the sample obtained, and difficulty in mapping the fetuses.

## 21. Physiological labor: its course and management.

### PHYSIOLOGICAL REASONS OF LABOUR

Neuro-reflexory factors: sensibility to irritation in cerebral cortex abruptly decreases at the end of pregnancy while increasing in the spinal cord.

"Childbirth dominant" is formed in the cerebral cortex ↗ increasing uterine sensitivity to oxytocin; increase in a-receptors and decrease in b-receptors ↗ higher uterine contractile capability.

Uterine Stretch theory: any hollow body organ when stretched to its capacity will inevitably contract to expel its contents. The uterus, which is a hollow muscular organ, becomes stretched due to the growing fetal structures. In return, the pressure increases causing physiologic changes (uterine contractions) that initiate labor.

Oxytocin theory: pressure on the cervix stimulates the hypophysis to release oxytocin from the maternal pituitary gland. As pregnancy advances, the uterus becomes more sensitive to oxytocin. Presence of this hormone causes the initiation of contraction of the smooth muscles of the body (uterus is composed of smooth muscles).

Progesterone deprivation theory:

Progesterone is the hormone designed to promote pregnancy. It is believed that presence of this hormone inhibits uterine motility. As pregnancy advances, changes in the relative effects estrogen and progesterone encourage the onset of labor. A marked increase in estrogen level is noted in relation to progesterone, making the latter hormone less effective in controlling rhythmic uterine contractions. Also, in later pregnancy, rising fetal cortisol levels inhibit progesterone production from the placenta. Reduce progesterone formation initiates labor.

Prostaglandin theory: in the latter part of pregnancy, fetal membranes and uterine decidua increase prostaglandin levels. This hormone is secreted from the lower area of the fetal membrane (forebag). A decrease in progesterone amount also elevates the prostaglandin level. Synthesis of prostaglandin, in return, causes uterine contraction thus, labor is initiated.

Theory of Aging Placenta: advance placental age decreases blood supply to the uterus. This event triggers uterine contractions, thereby, starting the labor.

## 22. Labor precursors.

PRODRMAL (PRE-LABOUR)	LABOUR
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Lightening and engagement

Increase in Braxton Hicks contractions ("practice" contractions)

Increasing pressure in the pelvis and rectum

Changes in energy level, mood, or habits

Changes in vaginal discharge

"Mucus plug" discharge, the mucus contains some blood

Diarrhea

Rupture of the amniotic sac membranes or decrease in AF quantity

BRAXTON-HICKS CONTRACTIONS

don't increase in strength and frequency

are usually felt only in the front

ease up with activity and are relieved with a change in position

the cervix remains intact

ACTUAL CONTRACTIONS:

Increase in strength and frequency, become painful

start in the lower back and spread to the lower abdomen or vice versa

intensify with activity and are not relieved with a change in position

the cervix thins and dilates

#### OVERVIEW OF LABOUR

Increased frequency of contractions is associated with formation of gap junctions between uterine myometrical cells caused by increased oxytocin and prostaglandins

Upper uterine segment (smooth muscle fibers) thickens for expelling the fetus down the birth canal; and lower uterine segment (mostly collagen fibers) thins out during contractions

Cervix softens and thins down due to oxytocin and prostaglandins that break collagen disulfide linkage

Cervical dilation occurs as the lower uterine segment is thinned and pulled up by the contractile upper uterine segment.

In early labour (latent phase) the rate of dilation is slow, but at 3-4 cm of dilation the rate reaches its maximum in the active phase of labour.

Complete dilation is expressed as 10 cm.

**23. The clinical course of the labor: signs of labor onset, the 1 stage of labor, its characteristics.**

THE THREE STAGES OF LABOR. Labor is divided into three separate stages.

The first stage of labor begins when uterine contractions of sufficient frequency, intensity, and duration are attained to bring about effacement and progressive dilatation of the cervix. The first stage of labor ends when the cervix is fully

dilated, that is, when the cervix is sufficiently dilated (about 10 cm) to allow passage of the fetal head. The first stage of labor, therefore, is the stage of cervical effacement and dilatation.

STAGE 1: from the onset of regular uterine contractions to complete cervical dilatation at 10 cm.

1.LATENT PHASE: from the onset of contractions to the acceleration of cervical dilation.

- Prepares cervix through effacement.
- No real descent of the fetus.
- Average duration is 4-6 hours, may be up to 20 hours.
- Abnormality: prolonged latent phase.

ACTIVE PHASE:

Cervical dilatation acceleration (at 4-5 cm) to complete dilatation at 10 cm

Cardinal movements of labour (the fetus descent in the latter part of the active phase)

Rate of dilation is 1.2 cm/h in a primipara and 1.5 cm/h in a multipara

Abnormalities: prolonged active phase, arrested active ph

#### **24. The 2nd stage of labor, its characteristics, duration.**

STAGE 2: begins with complete cervical dilation and ends with the delivery of the fetus through the birth canal as maternal pushing efforts augment the uterine contractions. May be up to 2 h in a primipara and 1 h in a multipara.  
Abnormalities: prolonged second stage or arrest of descent.

#### **25. The 3 stage of labor, its characteristics, duration. Methods of assessing blood**

loss.

STAGE 3: begins with delivery of the fetus and ends with expulsion of the placenta. Placental separation is often augmented with IV oxytocin infusion. May be up to 30 minutes.  
Abnormalities: prolonged third stage, arrest of placental separation, incomplete placental separation.

DURATION OF LABOUR

Normal duration: 9-12 h in a primipara, 7-8 h in a multipara

Rapid birth (oxytocia): 4-6 h (primipara), 2-4 h (multipara)

Extremely rapid birth: 2-4 h (primipara), to 2 h (multipara).

STAGE 3 OF LABOUR MANAGEMENT

After the delivery of the baby till total placental separation

Should take no longer than 30 minutes

#### **26. Biomechanism of labor in case of the occipitoanterior presentation.**

BIOMECHANISM (AOP)	OF	LABOUR
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1. DESCENT: as the fetal head engages and descends, it assumes an occiput transverse position because that is the widest pelvic diameter available for the widest part of the fetal head.
2. FLEXION: descending through the pelvis, the fetal head flexes so that the fetal chin is touching the fetal chest, the occipital (posterior) fontanel slides into the center of the birth canal and the anterior fontanel becomes more remote and difficult to feel. The fetal position remains occiput transverse.
3. INTERNAL ROTATION: with further descent, the occiput rotates anteriorly and the fetal head assumes an oblique orientation. In some cases, the head may rotate completely to the occiput anterior position.
4. EXTENSION: the curve of the hollow of the sacrum favors extension of the fetal head as further descent occurs, the fetal chin is no longer touching the fetal chest.
5. EXTERNAL ROTATION OF HEAD AND INTERNAL SHOULDERS ROTATION: the shoulders rotate into an oblique or frankly anterior-posterior orientation with further descent. This encourages the fetal head to return to its transverse position. This is also known as restitution.

**27. Biomechanism of labor in case of the occipitoposterior presentation**

BIOMECHANISM OF LABOUR IN POSTERIOR OCCIPUT POSITION

1. Internal flexion of the head, the posterior fontanel is the leading point
2. Internal rotation: the medial point between the two fontanelles becomes the leading one, the head goes in its suboccipitofrontal size (10 cm)
3. Additional head flexion: the head is fixed at the symphysis by the anterior margin of major fontanel
4. Extension of the head
5. External rotation of the head and internal of the shoulders

**28. Apgar scoring of a newborn.**

What Is the Apgar Score?

The Apgar score is a test given to newborns soon after birth. This test checks a baby's heart rate, muscle tone, and other signs to see if extra medical care or emergency care is needed.

The test is usually given twice: once at 1 minute after birth, and again at 5 minutes after birth. Sometimes, if there are concerns about the baby's condition, the test may be given again.

What Does "Apgar" Mean?

Apgar stands for "Appearance, Pulse, Grimace, Activity, and Respiration."

In the test, five things are used to check a baby's health. Each is scored on a scale of 0 to 2, with 2 being the best score:

- 1) Appearance (skin color)

2)Pulse (heart rate)

3)Grimace response (reflexes)

4)Activity (muscle tone)

5)Respiration (breathing rate and effort)

Apgar Scoring			
Apgar Sign	2	1	0
Appearance (skin color)	Normal color all over (hands and feet are pink)	Normal color (but hands and feet are bluish)	Bluish-gray or pale all over
Pulse (heart rate)	Normal (above 100 beats per minute)	Below 100 beats per minute	Absent (no pulse)
Grimace ("reflex irritability")	Pulls away, sneezes, coughs, or cries with grimace	Facial movement only (no grimace) with stimulation	Absent (no response to stimulation)
Activity (muscle tone)	Active, spontaneous movement	Arms and legs flexed with little movement	No movement, "floppy" tone
Respiration (breathing rate and effort)	Normal rate and effort, good cry	Slow or irregular breathing, weak cry	Absent (no breathing)

Scores are between 10 and 0. Ten is the highest score possible, but few babies get it. That's because most babies' hands and feet remain blue until they have warmed up.

#### What Does My Baby's Score Mean?

A baby who scores a 7 or above on the test is considered in good health. A lower score does not mean that your baby is unhealthy. It means that your baby may need some immediate medical care, such as suctioning of the airways or oxygen to help him or her breathe better. Perfectly healthy babies sometimes have a lower-than-usual score, especially in the first few minutes after birth.

A slightly low score (especially at 1 minute) is common, especially in babies born:

after a high-risk pregnancy

through a C-section

after a complicated labor and delivery

prematurely

At 5 minutes after birth, the test is given again. If a baby's score was low at first and hasn't improved, or there are other concerns, the doctors and nurses will continue any necessary medical care. The baby will be monitored closely.

#### What if My Baby Has a Low Score?

Many babies with low scores are perfectly healthy and do just fine after adjusting to life outside the womb.

If your doctor or midwife is concerned about your baby's score, he or she will let you know and will explain how your baby is doing, what might be causing problems (if any), and what care is being given.

#### What Else Do I Need to Know?

This test was not designed to predict a baby's long-term health, behavior, intelligence, personality, or outcome. It was designed to help health care providers tell a newborn's overall physical condition so that they could quickly decide whether the baby needed immediate medical care.

With time to adjust to the new environment and with any necessary medical care, most babies do very well. So rather than focusing on a number, just enjoy your new baby!

**29. The management of postpartum period. Methods of assessing postpartum hemorrhage. Prophylactic methods of postpartum hemorrhage.**

**30. Signs of placental separation. The techniques of delivery of the expelled placenta and manual separation.**

#### PLACENTAL SEPARATION SIGNS:

1.Shredder's: uterus contracts, becomes thicker; the size of the uterus decreases; uterine fundus rises and is seen 4-5 cm above the umbilicus, slightly deviated to the right

2.Alfeld's: external part of the umbilical cord lengthens (best seen with Kocher's clamp attached)

3.Dovzhenko's: deep breathing doesn't affect umbilical cord length

4.Klein's: on making a pushing effort the umbilical cord doesn't move significantly

5.Strassman's: one of the most significant and reliable. Take the umbilical cord and slightly press it, then make light slaps of the uterus. If placenta is still attached, the umbilical vein will be filled with blood from placental vessels, and the hand holding the cord will feel fluctuation

6.Kustner's – Chukalov's: when placenta is separated, the umbilical cord doesn't go inside during this procedure.

**31. Primary sanitation of a newborn.**

**32. The physiological changes during puerperium. Management of the physiological postpartum period.**

The puerperium is defined as the period of confinement during and just after birth and usually includes the 6 subsequent weeks.

#### UTERINE CHANGES:

##### Uterine vessels

Successful pregnancy requires a massive increase in uterine blood flow. After delivery, the caliber of extrauterine vessels decreases to equal, or at least closely approximates that of the pre-pregnant state. Within the puerperal uterus, larger blood vessels are obliterated by hyaline changes, gradually resorbed, and replaced by smaller ones. Minor vestiges of the larger vessels may persist for years.

##### Cervix and lower uterine segment:

The cervical opening contracts slowly, and for a few days immediately after labor readily admits two fingers. By the end of the first week, it has narrowed. As the opening narrows, the cervix thickens, and a canal reforms.

The external os does not completely resume its pre-gravid appearance. It remains somewhat wider, and typically, bilateral depressions at the site of lacerations remain as permanent changes that characterize the parous cervix.

Cervical epithelium undergoes considerable remodeling as a result of childbirth. The markedly thinned-out lower uterine segment contracts and retracts, but not as forcefully as the body of the uterus. Over the course of a few weeks, the lower segment is converted into a barely visible uterine isthmus located between the uterine corpus above and the internal cervical os below.

#### Involution of the uterine corpus:

Immediately after placental expulsion, the fundus of the contracted uterus is slightly below the umbilicus. The uterine body then consists mostly of myometrium covered by serosa and lined by basal decidua. The anterior and posterior walls are in close contact, each measures 4 to 5 cm in thickness. Because its vessels are compressed by the contracted myometrium, the puerperal uterus on section appears ischemic when compared with the reddish-purple hyperemic pregnant organ.

Two days after delivery, the uterus begins to shrink, and within 2 weeks it has descended into the cavity of the true pelvis. It regains its previous non-pregnant size about 4 weeks after delivery. Immediately postpartum, the uterus weighs approximately 1000 gr. As the consequence of involution, 1 week later it weighs about 500 gr, decreasing at the end of the second week to about 300 gr, and soon thereafter to 100 gr or less.

#### Afterpains:

In primiparas, the puerperal uterus tends to remain tonically contracted, whereas in multiparas, the uterus often contracts vigorously at intervals, giving rise to afterpains. They are more pronounced as parity increases. They worsen when the infant suckles because of oxytocin release. Usually, they decrease in intensity and become mild by the third day.

#### Lochia:

Early in the puerperium, sloughing of decidual tissue results in a vaginal discharge of variable quantity; this is termed lochia.

It consists of erythrocytes, shredded decidua, epithelial cells, and bacteria. For the first few days after delivery, there is blood sufficient to color it red - lochia rubra.

After 3 or 4 days, lochia becomes progressively pale in color – lochia serosa.

After about the 10th day, because of an admixture of leukocytes and reduced fluid content, lochia assumes a white or yellowish-white color - lochia alba.

Lochia persists for up to 4 weeks and may stop and resume up to 8 weeks after delivery.

#### Placental site involution:

Complete extrusion of the placental site takes up to 6 weeks.

This process is of great clinical importance, for when it is defective, late-onset puerperal hemorrhage may begin. Immediately after delivery, the placental site is about the size of the palm of the hand, but it rapidly decreases. By the end of the second week, it is 3 to 4 cm in diameter. Within hours of delivery, the placental site normally consists of many thrombosed vessels that ultimately undergo organization.

#### MAMMARY GLANDS

Each mature mammary gland is composed of 15 to 25 lobes.

The lobes are arranged radially and are separated from one another by varying amounts of fat. Each lobe consists of several lobules, which in turn are made up of large numbers of alveoli.

Every alveolus is provided with a small duct that joins others to form a single larger duct for each lobe. These lactiferous ducts open separately on the nipple, where they may be seen as minute but distinct orifices. The alveolar secretory epithelium synthesizes the various milk constituents.

**Breast feeding:**

After delivery, the breasts begin to secrete colostrum, which is a deep lemon-yellow-colored liquid. It usually can be expressed from the nipples by the second day.

**COLOSTRUM:**

Compared with mature milk, colostrum contains more minerals and protein, much of which is globulin, but less sugar and fat. Colostrum secretion persists for about 5 days, with gradual conversion to mature milk during 4 weeks. Antibodies are present in colostrum, and its content of immunoglobulin A (IgA) may offer protection for the newborn against enteric pathogens. Other host resistance factors that are found in colostrum and milk include complement, macrophages, lymphocytes, lactoferrin, lactoperoxidase, and lysozymes.

**MILK:**

Human milk is a suspension of fat and protein in a carbohydrate-mineral solution. Gestational weight gain has little impact on the subsequent milk quantity or quality.

A nursing mother easily makes 600 mL of milk per day. Major proteins, including L-lactalbumin, B-lactoglobulin, and casein, are also present. Essential amino acids are derived from blood, and non-essential amino acids are derived in part from blood or synthesized in the mammary gland. Most milk proteins are unique and not found elsewhere.

**Lactation inhibition:**

Approximately 40% of women currently elect not to breast feed, and many experience considerable breast pain and engorgement. Milk leakage, engorgement, and breast pain peak at 3 to 5 days postpartum. As many as 10% report severe pain up to 14 days postpartum, and 25 – 50% of all women use analgesia for breast pain relief.

Taking the view that there is no need for pharmacological therapy for lactation suppression, it is recommended that medications should no longer be used for lactation suppression.

Cabergolin is the best drug for lactation inhibition.

**33. Anatomical and physiological features of a mature newborn.**

**34. The course and management of pregnancy and labor in women with acquired and congenital heart defects. Contraindications for the pregnancy.**

**Incidence of heart disease:**

Varies between 0.1 – 4.0 %, average 1%

Mortality due to heart disease has decreased

Devpd countries – maternal mortality due to heart disease has increased

Pregnancy with heart disease has increased

Devpd countries – rheumatic is decreasing

Congenital heart disease with pregnancy is also increasing

Hemodynamic changes in normal pregnancy:

PARAMETER	CHANGE (PERCENT)
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Plasma volume	+40
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Cardiac output	+43
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Heart rate	+17
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Mean arterial pressure	+4
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Stroke volume	+27
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Systemic vascular resistance	-21
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Pulmonary vascular resistance	-34
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Critical periods:

Changes start from as – 6weeks

Max changes around –30 weeks

Intra partum period

Just after delivery

Second week of puerperium

Pregnancy changes mimic cardiac disease:

Symptoms – breathlessness, weakness, oedema, syncope

Tachycardia

Splitting of 1st hear sound

Murmur – systolic , breast bruit

Displacement of apex beat – upwards to left

Symptoms of heart disease:

Progressive dyspnea or orthopnea

Nocturnal cough

Syncope

Chest pain

Hemoptysis

Clinical findings of heart disease:

Cyanosis

Clubbing of fingers

Persistent neck vein distention

Systolic murmur grade 3/6 or greater

Diastolic murmur

Cardiomegaly

Persistent arrhythmia

Persistent split second sound

Pulmonary hypertension

Investigations: ECG – cardiac arrhythmias, hypertrophy

Echocardiography – cardiac status and structural anomalies

X-ray chest – cardiomegaly, vascular prominence

Cardiac catheterization – rarely

NYHA (New York Heart Association) Functional grading of heart disease:

Grade I: No limitation of physical activity- asymptomatic with normal activity

Grade II: Mild limitation of physical activity -Symptoms with normal physical activity

Grade III: Marked limitation of physical activity -Symptoms with less than normal activity, comfortable at rest

Grade IV: Severe limitation of physical activity- symptoms at rest

Classification of Heart Disease according to etiology:

Congenital – non cyanotic ( ASD, VSD, Pulm stenosis, coarctation of aorta), cyanotic (Fallots tetralogy, Eisenmenger's syndrome)

Rheumatic heart disease – MS, MR, AS, AR

Cardiomyopathy

Ischaemic heart disease

Others – conduction defects, syphilitic, thyrotoxic, hypertensive,

Classification of Heart Disease during pregnancy according to risk:

Low risk ( 0 – 1%) – ASD, VSD, PDA, MS-1,2, corrected FT

Medium risk ( 5 – 15 %) – MS-3,4, MS with atrial fibrillation, AS, uncorrected FT

High risk ( 25 – 50%) – PH, Eisenmengers Syndrome, aortic coarctation with valvular involvement, Marfans with aortic involvement

Poor prognostic indicators:

h/o heart failure, ischaemic attack, stroke

Arrhythmias,

Base line NYHA class 3 and 4

MV area below 2cm sq, AV area below 1.5

Ejection fraction less than 40%

Additional risk factors:

Anaemia

Infections

Hypertension

Physical labour

Weight gain

Multiple pregnancy

Caffein , alcohol intake

Pain

Drugs – tocolytic

Effect of pregnancy on heart disease:

Worsening of cardiac status

CCF, bacterial endocarditis, pulmonary edema, pulmonary embolism, rupture of aneurism

No long term effect on basic defect

Effect of heart disease on pregnancy:

Abortion

Preterm labour

IUGR

Congenital heart disease in baby – 5%

Intrauterine fetal demise

Management:

Requires-

High index of suspicion

Timely diagnosis

Effective management

Team Approach-

Obstetrician

Cardiologist

Anesthetist

Neonatologist

CTV surgeon

Nursing Staff

Preconceptional Counseling:

No pregnancy unless must esp in high risk types

Maternal mortality varies directly with functional classification at pregnancy onset

Optimal Medical/Surgical treatment pre-pregnancy

Counselling-

Maternal & Fetal risks

Prognosis

Social and cost considerations

Hospital delivery- Preferable at tertiary care centre

Medical termination of pregnancy:

Termination advised in early pregnancy in high risk group only – ( Primary pulmonary Ht, Eisenmenger syndrome, Coarctation of aorta, Marfan syndrome with dilated aortic root)

Only in 1st trim, better before 8 weeks

Suction evacuation preferred

MTP also carries risk for life

Antenatal care:

Clear counseling of risk and prognosis

ANC every 2 weeks upto 30 weeks then weekly

On each visit-note-pulse rate, BP, cough dyspnea, weight, anaemia, auscultate lung bases, re-evaluate functional grade

Ensure treatment compliance

Exclude fetal congenital anomaly by level-III USG and fetal ECHO at 20 weeks in maternal congenital heart disease

Fetal monitoring

Special Advice:

Rest, Avoid undue excitement/strain

Diet/ Iron and vitamins

Hygiene, dental care to prevent any infection

Dietary salt restriction (4-6g/d)

Avoid smoking, drugs – betamimetics

Early diag and tmt of PIH, infections

Therapeutic/prophylactic cardiac interventions as applicable-

Benzathine Penicillin 12 lacs at 3 weeks - to prevent recurrence of rheumatic fever

Diuretics, Beta Blockers, Digitalis, Anticoagulants

Surgical treatment as applicable - balloon mitral valvotomy

Indications for admission:

Elective admission-

NYHA 1 – 2 weeks before EDD

NYHA 2 – 28 to 30 weeks

NYHA-III/IV- Irrespective of POG as soon as patient comes

To Change from oral anticoagulants to heparin-early pregnancy, 36 weeks in patients on anticoagulant

Emergency admission-

Deterioration of functional grade

Symptoms and signs of complications- Fever/ persistent cough/ basal crepts/ tachyarrhythmias (P/R >100 min)/ JVP>2cm/Anaemia/ Infections/ PET/Abnormal weight gain /other medical disorders

Labor and Management:

Institutional delivery

Induction of Labor

Only for obstetric indications

Oxytocin preferred- Higher concentration with restricted fluid

Intracervical foley instillation esp in congenital heart

disease

PGE2 Gel may be employed- Vasodilatation - use with caution

Management in first stage of labor:

Confined to bed- propped up or semi recumbent

Intermittent oxygen inhalation 5-6 l/min

Sedation and analgesia- (Epidural, pethidine, tramadol)

Cautious use of I.V. fluids (not >75ml/hr except in aortic stenosis and VSD)

Stop anticoagulants

Digitalise if in CHF, P.R.>110/ min, R/R >24/min

Management in first stage of labor:

Diuretics in pulmonary congestion

Deriphyllin if bronchospasm

Prevention of infective endocarditis

Cardiac monitoring and pulse oximetry ±pulmonary artery catheterisation- continuous haemodynamic monitoring

Evaluation by Anaesthetist and cardiologist

SABE Prophylaxis: Not recommended for all

At risk for infection                    Ampicillin-2G IV/IM + Gentamicin 1.5mg/kg (max120)        6 hours later- Ampicillin-1G I.V./IM or 1G P.O.

Severe lesions                          If Allergic to Penicillin -Vancomycin-1G I. or Clindamycin – IV  
+ Gentamicin-1.5mg/kg

Management of second stage of labor:

Delivery in propped up position

Avoid forceful bearing down

Adequate pain relief-epidural/pudendal block avoid spinal/Saddle block

Cut short second stage of labor- episiotomy, vacuum, forceps – not always must

Strict Cardiovascular monitoring

Third stage of labor:

AMTSL-10 U oxytocin IMI

Avoid bolus syntocinon/Ergometrine

Propped Up, oxygen inhalation

Furosemide I.V. 40 mg

Pethidine/morphine (15mg)

Watch for signs of CHF & Pul. Edema

Treat PPH energetically

First Hour After Delivery :

Propped up/sitting position, oxygen

Watch for signs of pulm edema

Sedation

Antibiotic

#### **34. The course and management of pregnancy and labor in women with acquired**

**and congenital heart defects. Contraindications for the pregnancy.**

Cardiovascular diseases rate in pregnant women is 10% and higher.

Women with heart diseases present before pregnancy: acquired rheumatic cardiac defects – 75 - 90 %, congenital defects – 3 - 10 %, myocarditis, cardiomyopathy, arterial hypertension (AH), ischemic heart disease (IHD) and other heart diseases – less than 4 %

Women with heart diseases that develop during pregnancy: myocarditis, cardiomyopathy, IHD and other heart diseases are the most common, while congenital malformations are rarely seen.

Cardiovascular diseases:

rheumatism

congenital and acquired heart diseases

conditions after cardiac surgery, also called “operated heart”

myocardial diseases: myocarditis, myocardial dystrophy, myocarditis-associated cardiosclerosis, cardiomyopathy

cardiac rhythm disturbances: sinus tachycardia, extrasystole, paroxysmal tachycardia, atrial fibrillation, Wolff-Parkinson-White (WPW) syndrome, cardiac conduction impairment

hypertonic disease

symptomatic hypertension

arterial hypotension

venous diseases: varicose veins, thrombosis and thromboembolism

Clinical groups of congenital heart malformations in pregnant women:

Malformations obstructing the blood-flow: lung artery stenosis, aortic orifice stenosis, aortic coarctation

Malformations with left-to-right shunts: open ductus arteriosus, atrial septal defect, ventricular septal defect, Eisenmenger's syndrome.

Malformations with right-to-left shunts: Fallot's diseases, magistral vessels transpositions.

Acquired heart defects in pregnant women:

mitral stenosis

mitral valve insufficiency

mitral valve prolapse

aortic stenosis

aortic valve insufficiency

tricuspid valve defects

Pregnancy and delivery prognosis in pregnant women with heart diseases depend on:

disease form

cardiac insufficiency stage/class

intensity of rheumatism

presence of rheumatic attacks

surgical treatment efficacyCommon principles of pregnancy follow-up in women with cardiovascular diseases

1st hospitalization before 10-12 weeks with a diagnostic aim; for deciding whether pregnancy prolongation is reasonable and for treatment correction

2nd hospitalization: 18 – 20 weeks for pregnancy prolongation reasonability estimation, control and correction of hemodynamic disturbances, treatment correction.

3rd hospitalization: 28 – 32 weeks for reserved myocardial resources estimation; for intracardial hemodynamics estimation during maximum hemodynamic stress

4th hospitalization: 36 – 37 weeks for partus preparation and defining methods and terms of delivery

Pregnancy risks categories in women with heart diseases (Baur)

-Congenital heart defects with insignificant left-to-right shunts. Insignificant valvular insufficiency/stenosis. Surgically treated atrial septal defect, patent ductus aorticus and uncomplicated ventricular septal defect.:.

Minimally elevated risk, insignificant for pregnancy

-septal defect with blood shunt < 5%. Moderately significant hypertrophic obstructive cardiomyopathy. Surgically treated heart defects.:

Moderately elevated risk; pregnancy is reasonable if a woman is significantly interested in it.

-Severe aortic and mitral defects; severe lung artery stenosis, aortic and mitral insufficiency.

Stable angina.

Severe hypertrophic obstructive cardiomyopathy.

Not-operated or partially corrected Fallot's tetralogy.:

Risk is significantly elevated, pregnancy is relatively contra-indicated

- Severely expressed heart failure.

Severe pulmonary hypertension.

Severe cyanosis.

Unstable angina.:

Pregnancy is absolutely contra-indicated (maternal mortality 30-70%)

Unfavourable prognosis for both: a woman and a baby:

cardiac defects in women over 35 years old

significant ventricular or atrial hypertrophy

groups of extrasystoles combined with heart defects

episodes of heart failure during previous pregnancies

Cardiac insufficiency:

is an inability to provide an organism with sufficient blood flow due to increased metabolic needs during pregnancy and labour.

In pregnant women cardiac insufficiency is most frequently associated with acquired and congenital heart defects, myocardial diseases, chronic pulmonary diseases.

Critical periods:

I – before 16 weeks of gestation – rheumocarditic exacerbation (in 90 % of children - congenital abnormalities), risk of early gestosis

II – 26 – 34 weeks – high hemodynamic stress, increase circulatory volume, decrease Hb, decrease Ht, decrease blood viscosity

III – 35 weeks till labour – significant body mass increase, pulmonary blood-flow difficulties caused by high diaphragm position, possible occurrence of inferior vena cava syndrome and gestosis

IV – the beginning of labour till childbirth – significant cardiovascular stress increase (80-140%); labour may be painful, protracted

V – early postpartal period – may be complicated by a postpartal collapse caused by massive blood redistribution

VI – late postpartal period – rheumatism exacerbation, anemia, postpartal infection

Indications for pregnancy termination before 12 weeks:

subacute bacterial endocarditis  
active course of rheumatic carditis  
primary or recurrent during last 12 months rheumatic carditis  
mitral stenosis with cardiac insufficiency H2A; pulmonary edema in anamnesis  
combined mitral defect with prevailing stenosis  
severely expressed aortic stenosis; mitral stenosis combined with aortic insufficiency

significant tricuspid valve insufficiency; right atrioventricular fenestra stenosis  
pulmonary artery orifice stenosis  
aortic coarctation  
“blue” forms of congenital heart defects  
primary pulmonary hypertension, Eisenmenger’s syndrome  
Marfan’s syndrome with significant aortic root involvement  
cardiomegaly  
all congenital heart defects with H IIA-B, H III  
tachysystolic form of atrial fibrillation  
heart defects combined with arterial hypertension, chronic insufficiency of left ventricle, thyrotoxicosis  
unstable atrioventricular block I-II  
Total atrioventricular block with heart rate < 40 bpm or episodes of atrial fibrillation  
ineffective commissurotomy or re-stenosis H1  
hypertonic disease III  
Natural delivery is possible in cases of compensated:  
mitral valve insufficiency  
combined mitral defect with prevailing left atrioventricular fenestra stenosis  
aortic heart defects  
congenital acyanotic heart disease

presence of cardiologists and anesthesiologists is necessary  
sufficient pain-management during labour  
intrauterine fetal hypoxia prevention

Fowler's position (head-up)

oxygenation (hyperbaric oxygenation)

heart glycosides and antiarrhythmic medication if needed

Obstetric forceps for 2nd labour period shut-off:

cardiac insufficiency symptoms (even if they were eliminated before delivery)

coronary failure

Planned C-section:

circulatory failure II-III степени

rheumatic carditis

significantly expressed mitral stenosis II-III

septic endocarditis

aortic coarctation combined with high arterial hypertension

valvular prostheses combined with ineffective cardiac insufficiency treatment

multiple valvular prostheses

paravalvular fistulasa

complications of heart defects surgical treatment

re-stenosis, re-canalization after mitral commissurotomy

severe steady atrial fibrillation

total atrioventricular block (heart rate < 40 bpm)

Postpartal period:

bleeding prophylaxis (oxytocin, prostin F2 $\alpha$ , methylergometrin; if there's a risk of pulmonary edema – Lasix 20 mg)

thorough monitoring during first 48-72 hours (hemodynamic changes)

early walking, therapeutic exercise, elastic stocking

pyoinflammatory process prevention

discharge from hospital on the 10th-12th day

in cases of complications – bed regime, hospitalization into cardiologic department, rehabilitation therapy during 6-12 months

breastfeeding is contra-indicated in cases of circulatory failure II-III

specific treatment, cardiac glycosides, anticoagulants are administered together with lactation arrest

rehabilitation is carried out in ambulatory conditions

#### FETAL AND NEWBORN COMPLICATIONS:

Severe prematurity

Intracranial hemorrhage

Fetal death

Fetal hypotrophy

Intrauterine fetal hypoxia

Thrombocytopenia in newborns (60–80%)

**35. The course of pregnancy and labor and their management in women with hypertensive diseases. Contraindications for the pregnancy.**

AH rate in pregnant women is 6 – 8 %.

Hypertension complicating pregnancy causes maternal mortality in 20 – 30 %.

Perinatal mortality (30-100 %) and preterm delivery(10-12 %) in patients with AH significantly exceed those in pregnant women without AH.

In pregnant women:

uterine-placental and renal blood flow disturbances occur if ABP is higher than 140/90 mm Hg, which is considered to be upper normal level; its exceeding is called arterial hypertension

Diagnostic criteria of AH in pregnant women:

Systolic ABP > 140 mm Hg or diastolic ABP > 90 mm Hg in 2 or more consecutive measurements with intervals > 4 hours.

If a woman was diagnosed with arterial hypertension before pregnancy, 30% elevation of systolic ABP and 15% elevation of diastolic ABP indicates gestational hypertension.

ICD-10 (O10-O16):

O10:Pre-existing hypertension complicating pregnancy, childbirth and the puerperium

O11: Pre-existing hypertensive disorder with superimposed proteinuria

O12:Gestational (pregnancy-induced) oedema and proteinuria without hypertension

O13: Gestational (pregnancy-induced) hypertension without significant proteinuria

O14: Gestational (pregnancy-induced) hypertension with significant proteinuria, pre-eclampsia

O15: Eclampsia

O16: Unspecified maternal hypertension

AH course characteristics:

in 50% pregnant women ABP rises during first 14 weeks

in mid-gestation ABP often decreases; in stage I – to normal levels, in stage II – insignificantly during last 3 gestational months ABP rises

in cases of disease exacerbation which may occur in any gestational period ABP rises significantly which manifests with headaches, cardiac crisis, eye fundus lesion

AH exacerbation in mid-pregnancy leads to gestosis, miscarriage, intrauterine fetal death

hypertonic crises during pregnancy present with severe state of health disturbance, high ABP and extreme headache

Pregnancy and labour complications:

- Gestosis (36 %)
- Late miscarriage (3 %)
- Premature birth (12 %)
- Placental abruption
- Fetoplacental insufficiency (37 %)
- Fetal hypotrophy (in every 3rd fetus with fetoplacental insufficiency regardless of its treatment)
- Perinatal mortality (29 %)
- Pre-eclampsia and eclampsia during labour
- More profuse bleeding in the 3rd labour period

Risk grade:

- I risk grade – minimal, pregnancy complications and AH exacerbation occur in 20%; correlates with AH stage I.
- II risk grade – marked, pregnancy complications - 50 %; AH exacerbation in more than 20%. Correlates with AH stage II.
- III risk grade – maximal, with severe pregnancy and labour complications in more than 50%. Correlates with AH stage III and malignant form of AH.

AH TREATMENT DURING PREGNANCY:

- protective regimen – work and rest regulation, limited physical activity, stress and professional risks avoidance, rest a few times a day lying on the left side, sufficient day- and night-sleep
- diet – sufficient carbohydrates, proteins and vitamins intake; limited fat intake; salt-intake limitation doesn't have to be limited (up to 6 grams a day); body-mass control
- psychological preparation before labour
- physical therapy – strictly controlled physical therapy; walking; oxygen-therapy; laser-therapy
- drugs – sympatholytics, beta-blockers, vasodilators,
- Ca++ antagonists, diuretics, ACE-inhibitors

Pharmacological treatment of AH in pregnant women:

1)Methyldopa (category B)

2)Labetalol (category C)

3) $\beta$ -blockers

Metoprolol (cat. C) 25-100 mg daily

Nebivolol (cat. C) 5 mg daily

Pindolol (cat. B)

Oxprenolol (cat. C)

Bisoprolol (cat. C)

Second-line drugs:

Calcium antagonists (cat. C)

Nifedipin 30–60 mg daily

Amlodipin 5–10 mg daily

Isradipin

Phelodipin

Nikardipin

Rarely used drugs:

Hydralazine (cat. C)

$\alpha$ -blockers (cat. C)

Sympatholytics (cat. D)

Drugs recommended to avoid:

Atenolol (cat. D) , Diuretics (cat. B)

Delivery strategies in patients with AH:

Hospitalization 3-4 weeks prior to delivery

In cases of stage I AH natural delivery is possible with conservative supportive treatment; anesthesia; controlled hypotension in the 2nd labour period or 2nd period shut-off (forceps)

Stage II AH: C-section is reasonable, especially with co-existing obstetric indications

Stage III AH: pregnancy is terminated in any gestational age; early term – abortion, later – C-section (preferably with sterilization)

**36. The course of pregnancy and its management in women with diabetes mellitus. The labor in women with diabetes mellitus, management of the postpartum period.**

**36. The course of pregnancy and its management in women with diabetes mellitus. The labor in women with diabetes mellitus, management of the postpartum period.**

General principles for the management of diabetic pregnancies

When maternal diabetes precedes the pregnancy it is associated with an increased risk of miscarriage, congenital abnormalities, accelerated fetal growth, late stillbirth, birth trauma, neonatal hypoglycaemia and long-term health problems for the child. Gestational diabetes is associated with those complications attributable to maternal hyperglycaemia arising in the latter half of pregnancy.

The principal tenet for the management of all diabetic pregnancies, from the time of conception through to the time of delivery, is to strive for maternal euglycaemia.

The need for good glycaemic control is based on evidence implicating hyperglycaemia with maternal and fetal complications. Although other maternal metabolic disturbances do occur that may be detrimental to pregnancy, such as changes in lipid metabolism, it is hyperglycaemia, not dyslipidaemia, that is particularly harmful to embryogenesis and it is glucose, not fat, that is the fetal fuel substrate responsible for fetal hyperinsulinaemia and accelerated fetal growth.

To achieve the level of glycaemic control required to minimize complications associated with diabetic pregnancies, hospitals require a multidisciplinary diabeticobstetric team working to local agreed guidelines that are based on national and international agreed best practice. The structured approach to the management of diabetic pregnancies is discussed below, see Table 3.

Prior to pregnancy

**PRECONCEPTION COUNSELLING**

When women with diabetes attend a pre-conception clinic, pregnancy outcomes are improved. These clinics provide an opportunity for glycaemic control to be intensively managed, high-dose folic acid supplements prescribed and information given on when to stop potentially harmful drugs, such as Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers. Women can also be assessed for diabetic complications, and aspirin or heparin considered for those at risk of pre-eclampsia or thrombophilia.

The importance for the best achievable glycaemic control prior to pregnancy is stressed by studies showing that when the HbA1c value, the measure of overall glycaemic control, are within the normal range the risk of congenital abnormalities approaches that of the non-diabetic population. To achieve this level of control requires women with type 1 diabetes, and many of those with type 2 diabetes, to have 4–5 insulin injections a day or an insulin pump. A long-acting basal insulin is usually given at night with a short-acting bolus insulin taken with each meal. For women with type 2 diabetes previously on oral hypoglycaemic agents switching to insulin remains standard practice; however, certain oral hypoglycaemic agents are now being prescribed to women with gestational diabetic pregnancies and pregnant women with polycystic ovarian syndrome. While many women with type 2 diabetes require multiple daily injections of insulin others may achieve good glycaemic control using a twice-daily mixture of a short- and long-acting insulin, or alternatively a short-acting insulin three times a day with meals.

**37. Pyelonephritis: its course and diagnosis in pregnant women; the course and management of pregnancy, labor. Principles of medical treatment.**

**38. Glomerulonephritis: its course and diagnosis in pregnant women; the course and management of pregnancy, labor. Principles of medical treatment.**

**39. Acute and chronic virus hepatitis, primary cholestatic liver impairments, the course and management of pregnancy, labor.**

Hepatitis B

Pathophysiology: Hepatitis B is a DNA virus that is spread by infected body secretions.

Ways of transmissions:

Contaminated needles

Sexual contacts

Perinatal transmission

Vertical transmission accounts for 40% of all chronic HBV infections.

Most HBV infections are asymptomatic.

Maternal infection (3 types):

Asymptomatic HBV:

The majority of all infected patients fall into this category with no impact on maternal health. Hepatitis B surface antigen (HBsAg) is the screening test used for identifying existing infection and obtained on all pregnant women/ a positive HBsAg test followed up with a complete hepatitis panel and liver Enzymes assessing for active or chronic hepatitis.

**Acute hepatitis:**

Acute and chronic HBV infections can result in right upper quadrant pain and lethargy varying according to the severity of the infection. Lab tests show elevated bilirubin and high liver enzymes.

**Chronic hepatitis:**

Cirrhosis and hepatocellular carcinoma are the most serious consequences of chronic hepatitis/

**Fetal and neonatal infections**

**Fetal infection:**

Transplacental infection is rare Occur mostly in the third trimester – 25-76%

The main route of infection arises from exposure to or ingestion of infected genital secretions at the time of vaginal delivery

Neonatal infection develops in only 10% of mothers positive for HBsAg

Pregnancy complications in women with HBV infections

Gestational vomiting 29–35%

Gestosis 22%

Threat of preterm labour 53%

Preterm labour 22–38%

Bleeding, Postpartum complications, Placental insufficiency

**Hepatitis C**

**Ways of transmissions:**

Contaminated needles ,Sexual contacts ,Perinatal transmission ,Hepatitis C is less infectious than hepatitis B.

Asymptomatic course in 75% of cases

Vertical transmission consists of 5% – 90%.

The main principle management of pregnancy and delivery in the acute stage of viral hepatitis any etiology - warning abortion

The effect of pregnancy on the course of chronic viral hepatitis

pregnancy does not affect the course of the disease the majority of patients

the course of chronic hepatitis in pregnant women is characterized, as a rule, low activity and rarity of exacerbations

the disease occurs more often in the first half of pregnancy or after delivery

Gestational complications:

Gestosis , miscarriage, the increase in perinatal mortality, vertical transmission hepatitis

Pregnancy is not contraindicated in women who are infected with hepatitis viruses.

Antiviral therapy is not recommended during pregnancy.

Infection occurs during delivery, transplacental and postnatal.

Caesarean section does not reduce the risk of infection of the child.

The presence of chronic HBV and HCV infection is not a contraindication to breastfeeding.

Acute cholecystitis

Acute cholecystitis takes the second place on prevalence of surgical diseases in pregnant women (after acute appendicitis).

Frequency of cholecystitis is 1 per 1000 - 2000 pregnancies

Frequency of the cholecystectomy in pregnant women is 0.3%

Obstetric complications:

premature birth ,premature rupture of amniotic fluid,violation of contractile activity of the uterus, bleeding, intrauterine fetus hypoxia,intrauterine growth retardation of fetus , high perinatal mortality

Indications for surgery:

the inefficiency of medical treatment for 2-3 days with intravenous fluids, nasogastric suction, and analgesics

recurring attacks cholecystitis ,Repeated episode of jaundice ,suspected gall bladder perforation ,symptoms of peritonitis ,acute cholecystitis , acute pancreatitis ,the presence of cholangitis

destructive changes of the gallbladder wall.

Cholecystectomy is performed in the second trimester of pregnancy, after 3 to 4 weeks after onset of the disease, when there is no critical condition.

The technique of surgery is typical.

Laparoscopic cholecystectomy is possible in 13-23 weeks of pregnancy.

Obstetric tactics: the vaginal delivery, cesarean section is performed in the presence of obstetric indications.

**40. The course and management of pregnancy and labor in women with appendicitis, pancreatitis, cholecystitis, intestinal obstruction. Indications for the abortion.**

Acute abdominal complications

Appendicitis

Frequency - 3,2 - 5,2 %.

The clinical picture of acute appendicitis

Diagnosis in early pregnancy is not much of a problem as the signs and symptoms of appendicitis is same in the non-pregnant woman.

Epigastric pain or around the abdomen ,Nausea, vomiting, Temperature rise

The muscles of the anterior abdominal wall

Positive signs of peritoneal irritation (at the location of the appendix behind the uterus peritoneal symptoms may be absent) , Leucocytosis

Management:

Need surgical treatment for any form of appendicitis.

Typical appendectomy on Volkovich-Dyakonov's method is executed in uncomplicated appendicitis In the first half of pregnancy.

lower median laparotomy is performed in complicated appendicitis, and in the second half of pregnancy for the best revision of the abdominal cavity and drainage.

therapy for saving pregnancy is appointed in the postoperative period.

Natural delivery is carried the postoperative period

if there are obstetric indications for caesarean section the operation caesarean section with subsequent hysterectomy should be performed during the operation appendectomy

Delivery through the birth canal should be carry out if the acute appendicitis develops in partus. Appendectomy is performed after delivery. Abdominal drainage is necessary.

Ruptured stomach ulcer and duodenal ulcer:

This pathology is rare during pregnancy but extreamely serious.

Perforation of gastroduodenal ulcers occur more often in the third trimester of pregnancy or in the postpartum period.

Clinical signs:

Violent, sudden pain in epigastria, which then spreads to the abdomen.

Expressed muscles defense the of the anterior abdominal wall, the symptoms of peritoneal irritation.

Vomiting, dry tongue.

The most important diagnostic finding is air under the diaphragm - (with percussion – tympanic sound).

Diagnosis:

Anamnesis data

Clinical symptoms

The results of endoscopic and x-ray examinations

Management:

Emergency surgery is carried out

it is advisable to abortion in case of detection of this disease up to 12 weeks of pregnancy

When premature labour occurs in the postoperative period the therapy is necessary for preservation

Natural delivery is carried out in term in the postoperative period if there are no obstetric indications

If there are obstetric indications for cesarean section during the operation the caesarean section with subsequent hysterectomy with tubes and drainage of the abdominal cavity are performed.

Acute pancreatitis:

The frequency of acute pancreatitis

– 1:2800 – 1:11468 pregnancies

The clinical sings:

The course of Acute pancreatitis in pregnant women is extremely heavy.

Acute encircle or persistent pain in epigastralna area

Temperature rise

Symptoms of peritoneal irritation

Multiple Nausea, vomiting

The skin and visible mucous are pale, dry, sometimes with a yellowish shade

The tongue is dry with white bloom

There are decreased urine output, hematuria, paresis and bowel obstruction In severe cases

Diagnosis:

Clinical symptoms

Dynaemic ultrasound examination,Alpha-amylase and lipase definition,Diagnostic laparoscopy (up to 16 weeks).

Management:

Treatment of pancreatitis during pregnancy is primarily medical.

Medical treatment should be complex:

reduction of the pain syndrome

reduced secretory activity of the pancreas, inactivation of proteases

infusion and antibacterial therapy

Surgery may be indicated in cases of pancreatic abscess

If surgery is necessary the interruption of pregnancy is indicated

therapy for maintaining of pregnancy if it is not term of labour

Natural delivery in postoperative period

If there are obstetric indications for cesarean section during the operation the caesarean section with subsequent hysterectomy with tubes and drainage of the abdominal cavity are performed.

Acute cholecystitis :

Acute cholecystitis takes the second place on prevalence of surgical diseases in pregnant women (after acute appendicitis).

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Frequency of the cholecystectomy in pregnant women is 0.3%

Obstetric complications:

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symptoms of peritonitis ,acute cholecystitis, acute pancreatitis ,the presence of cholangitis

destructive changes of the gallbladder wall.

Cholecystectomy is performed in the second trimester of pregnancy, after 3 to 4 weeks after onset of the disease, when there is no critical condition.

The technique of surgery is typical.

Laparoscopic cholecystectomy is possible in 13-23 weeks of pregnancy.

Obstetric tactics: the vaginal delivery, cesarean section is performed in the presence of obstetric indications.

Acute intestinal obstruction:

During pregnancy frequency of acute intestinal obstruction is increased in 2-3 times, mainly in the third trimester of pregnancy

The frequency of AIO is 1: 40 000 - 1: 50000 pregnancies , Mortality - more than 20 %

Fetus death - 60 - 75% ,All forms of intestinal obstruction occur in Pregnant women

The most common time period s in pregnancy for this to occur are the early second trimester, late in pregnancy and immediate puerperium

The diagnosis may be difficult.

Management:

the continuation of the pregnancy in the first half of pregnancy

Preterm delivery is necessary if intoxication increases

Natural delivery is carried out, then should perform the operation on intestines

a caesarean section is produced in the absence of conditions for fast natural delivery, and then surgical treatment of intestinal obstruction

abdominal delivery is performed if there are obstetric indications or perytonitis with mandatory supracervical uterus amputation.

#### **41. Sexually transmitted diseases (Chlamydia infection, mycoplasmosis, syphilis, gonorrhea, HIV): the course and management of pregnancy, labor.**

##### **PERINATAL INFECTIONS**

The pregnant woman and her fetus are susceptible to many infectious diseases that may be serious and life-threatening.

Infections contribute to intrauterine infecting of fetus, increasing to perinatal morbidity and mortality.

M Pathways of infection to the fetus

Vertical transmission

Ascending infection mortality rate in infections is about 17-36%

Transplacental pathway of infection is possible with the destruction of chorionic villi. Thus, there is a concentration of the pathogen in intervillous space affected villous epithelium and stroma, endothelium fetal capillaries. All this promotes the transition of the pathogen in the fetus blood. However, the viruses can cross to the fetus through the intact placenta amniotic membranes.

The risk of infection increases with the presence of pathological changes of the placenta, which take place in gestosis, cardiovascular and endocrine diseases etc.

##### **ASCENDING PATHWAY**

Alternatively, organisms may colonize and infect the fetus during labor and delivery. Thus, ascending infection by bacteria (e.g., Escherichia coli, group B streptococci, Ureaplasma urealyticum) in preterm rupture of membranes, prolonged labor and manipulations may increase the risk of neonatal infection

Infection can develop in contact amniotic fluid in the stomach and the lungs of the fetus due to aspiration syndrome

## SYPHILIS

### Pathophysiology

Syphilis is caused by *Treponema Pallidum*, a motile anaerobic spirochete.

It is spread as sexually transmitted disease by intimate contacts between moist mucose membranes and through the placenta to a fetus from an infected mother

Antepartum syphilis can profoundly affect pregnancy outcome by causing preterm labor, fetal death, and neonatal infection by transplacental or perinatal infection.

Fortunately, of the many congenital infections, syphilis is the most readily prevented and the most susceptible to therapy.

Syphilis: Maternal infection Four types:

Primary syphilis is the first stage after infection. Papules become painless ulcers without rolled edges which appear 2-3 weeks after contact at the site of infection – vulva, vagina, cervix.

Secondary syphillis is characterized by systemic spirochetemia. 2-3 months after contact, fever, malaise, general adenopathy and maculapapular skin rash are seen.

Latent syphillis is characterized by absent of symptoms or physical findings. All tests are positive.

Tertiary syphillis is a symptomatic stage with symptoms dependent on which organ system is affected by the ulcerative nodules (gummas). Lesion location include the cardiovascular system, CNS or bone.

Fetal and neonatal infections

Fetal infection:

Transplacental infection is common with vertical transmission in primary and secondary syphillis

Manifestations of early congenital syphillis include nonimmune hydrops, macerated scin, anemia, thrombocytopenia, hepatosplenomegaly. May be fetal death.

Neonatal infection:

Late congenital syphillis is diagnosed after two years of age and includes “Hutchinson” teeth, mulberry molars, “saber”shins, saddle nose, and 8th nerve deafness.

### Diagnosis

In first period of disease serological tests remain negative, darkness microscopy of lesion exudate is positive for the spirochete.

Secondary syphillis – serological tests are positive. Serological screening test such as the Venereal Disease Research Laboratory (VDRL) slide test or the rapid plasma reagin (RPR) test should be performed at the first prenatal visit.

Because such reagin tests lack specificity, a treponemal test is used to confirm a positive result. These include the fluorescent treponemal antibody absorption test (FTAABS), the microhemagglutination

assay for antibodies to *Treponema pallidum* (MHA-TP) or the *Treponema pallidum* passive particle agglutination (TP-PA) test.

#### Treatment

Syphilis therapy during pregnancy is given to eradicate maternal infection and to prevent congenital syphilis.

Penicillin is the treatment of choice

There are no proven alternatives to penicillin therapy during pregnancy.

Erythromycin may be curative for the mother, but it does not prevent all congenital syphilis

The cephalosporins, such as ceftriaxone, and the newer macrolide, azithromycin, may prove useful in adults

Tetracyclines, including doxycycline, are effective for treatment of syphilis in the nonpregnant woman but are generally not recommended during pregnancy because of the risk of yellow-brown discoloration of fetal deciduous teeth.

#### **42. Cytomegalovirus and herpes infections, influenza, rubella, measles, tuberculosis, toxoplasmosis: the course and management of pregnancy, labor,**

#### CYTOMEGALOVIRUS

##### Pathophysiology

CMV is a DNA herpes virus that is spread by infected body secretions, and person-to-person transmission usually occurs through sexual or close and intimate contact

Up to 50% of pregnant women are CMV Ig G seropositive

There may be fetal intrauterine infection, intrapartum infection, or postpartum infection from breast feeding

Vertical transmission occurs during the viremia of primary infection

CMV is the most common cause of perinatal infection in the developed world

#### CYTOMEGALOVIRUS

##### Significance

Maternal infection – CMV infection during pregnancy is a mild, may be asymptomatic, but about 15% of adults have a mononucleosis-like syndrome characterized by fever, pharyngitis, lymphadenopathy, and polyarthritides with hepatitis.

Fetal infection – Manifestation of congenital infection may include symmetric growth retardation, nonimmune hydrops, microcephaly, intracranial calcifications, chorioretinitis, mental and motor retardation, sensorineural deficits, hepatosplenomegaly, jaundice, hemolytic anemia, and thrombocytopenic purpura.

## RUBEOLA (MEASLES)

### Pathophysiology

Most adults are immune to measles due to childhood immunization

Unvaccinated women may develop measles, and pregnant have an increased risk of pneumonia with adverse maternal and perinatal outcomes

Passive maternal immunization can be achieved by administering immune serum globulin (0.25 mL/kg, maximum dose 15mL), given intramuscularly within 6 days of exposure. Active vaccination is not done during pregnancy, but susceptible women can be vaccinated routinely postpartum

### Fetal Effects

The virus is not teratogenic, but there is an increased frequency of abortion, prematurity, and low-birthweight neonates with maternal measles. Transplacental infection is possible. If a woman develops measles shortly before birth, there is considerable risk of serious neonatal infection.

## RUBELLA

### Pathophysiology

Rubella is highly contagious RNA virus that is spread by respiratory droplets.

Vertical transmission can only occur during viremia of a primary infection because the result is residual lifelong immunity.

### Significance

Maternal infection - Rubella is usually a mild, febrile illness with a generalized maculopapular rash. Other symptoms may include arthralgias or arthritis, lymphadenopathy or conjunctivitis.

Fetal infection - Rubella is one of the most teratogenic agents. Transplacental infection rate is 90% in the first trimester of pregnancy, but only 5% in the third trimester. Manifestation may include symmetric growth retardation, microcephaly, or ventriculoseptal defect.

### Congenital Rubella Syndrome

Neonatal infection is characterized by following:

congenital eye defects, including cataracts and glaucoma

congenital heart disease, including patent ductus arteriosus and peripheral pulmonary artery stenosis

Sensorineural deafness - the most common single defect

Central nervous system defects, including microcephaly, developmental delay, mental retardation, and meningoencephalitis

### Pigmentary retinopathy

### Purpura

Hepatosplenomegaly and jaundice ,Radiolucent bone disease

### Blueberry muffin rashPREVENTION AND TREATMENT RUBELLA

All pregnant women should undergo rubella Ig G antibody screening. Rubella-susceptible women have to avoid known rubella cases.

Rubella vaccination should be avoided 1 month before or during pregnancy because the vaccine contains attenuated live virus.

No specific treatment

### INFLUENZA

#### Pathophysiology

These infections are caused by Influenza A and B form one genus of these RNA viruses.

Symptoms include fever, dry cough, and systemic symptoms.

Influenza A is more serious than influenza B and usually develops during winter.

Pregnant women do not tolerate serious pulmonary involvement

#### Significance

Maternal infection – results to a lot of complications; the most serious of them are viral pneumonia and secondary bacterial pneumonia

Fetal infection - There is no firm evidence that influenza A virus causes congenital malformations, but influenza passes through placenta and may cause intrauterine infection. Manifestation may include nonimmune hydrops, polyhydramnios, spontaneous abortion and preterm labor.

#### Prevention

Vaccination against influenza, optimally in October or November, is recommended for all women who will be pregnant during the influenza season at any gestational age. This is most important for women who have chronic underlying medical disorders such as diabetes, heart disease, asthma, or human immunodeficiency virus (HIV) infection.

#### Treatment

Amantadine and rimantadine are antiviral agents with specific activity against influenza A viruses

Given as chemoprophylaxis, both antivirals are 70 to 90% effective in preventing influenza.

They are especially recommended for prophylaxis for nonimmunized women at high risk for influenza complications.

If influenza develops, amantadine or rimantadine, begun within 48 hours of the onset of symptoms, reduces the duration of fever and systemic symptoms.

#### VIRAL INFECTIONS

##### Herpes simplex virus (HSV)

HSV is a DNA herpes virus that is spread by intimate mucocutaneous contact

Up to 50% of pregnant women are HSV Ig G seropositive

Most genital herpes from HSV II type, but can also occur with HSV I type

Transplacental transmission from mother to fetus can occur with viremia during the primary infection but is rare.

HSV infection predisposes to a residual lifelong latency with periodic recurrent attacks.

Differences between HSV I type and HSV II type

Characteristics : HSV I type , HSV II type

Clinical : Genitalia affected primarily , Infection primarily affects the genitals

Epidemiological: Infection occurs primarily not sexual way , Infection is transmitted primarily through sexual organs

##### CLINICAL INFECTION in mother

According to the American College of Obstetricians and Gynecologists (1999a), HSV-2 infections clinically may be divided into three groups:

Primary infection is indicated by no prior antibodies to HSV-1 or HSV-2. The incubation period of 3 to 6 days. This results from viremia and has systemic manifestation: a papular eruption with itching or tingling, which then becomes painful and vesicular, with multiple genital lesions that may coalesce (vagina, cervix, vulva and urethra); inguinal adenopathy, fever . Transplacental fetal infection is possible.

Nonprimary first episode defines newly acquired HSV-2 infection with preexisting HSV-1 cross-reacting antibodies.

Recurrent infection is reactivation of prior HSV-1 or HSV-2 infection in the presence of antibodies to the same type of HSV. This results from migration of the virus from the dorsal root ganglion but it is localized and less severe with no systemic symptoms. Fetal infection results from passing through a birth canal.

##### FETAL INFECTION

The transplacental infection rate is 50% with maternal primary infections;

Manifestation may include:

spontaneous abortion,

symmetric fetal growth retardation,

cerebral calcifications,

microcephaly

#### NEONATAL INFECTION

Neonatal infection develops when fetus passes through HSV infected birth canal: the neonatal attack rate is 50% with primary infection, but only 5% with recurrent infection.

Neonatal mortality rate is 50%.

Newborn infection has three forms:

Skin, eye, or mouth disease with localized involvement (45%).

Central nervous system disease with encephalitis, with or without above involvement (30%).

Disseminated disease with involvement of multiple major organs: meningoencephalitis, hepatosplenomegaly, mental retardation, pneumonia, jaundice, and petechiae (25 %).

#### DIAGNOSIS:

Serological - detecting antibodies to HSV glycoproteins G-1 and G-2, which evoke type-specific antibody responses to HSV-1 and HSV-2 infection (it indicates previously transferred infection)

Culture – detecting culture from fluid obtained from a ruptured vesicle or debrided ulcer

Polymerase chain reaction

#### TREATMENT

Antiviral therapy with acyclovir, famciclovir, and valacyclovir has been used for treatment of first-episode genital herpes in nonpregnant women.

Acyclovir and valacyclovir are safe for use in pregnant women. It seems reasonable to give acyclovir suppressive therapy beginning at 36 weeks for women with recurrent genital herpes who have had clinical recurrences during pregnancy

#### MANAGEMENT

A cesarean delivery should be performed in the presence of genital HSV lesions at the time of labor;

If membrane have been ruptured more than 6 hours, the virus may already have infected the fetus and cesarean section would be of no value

Vaginal delivery should be performed in the absence of genital HSV lesions or in the presence herpes lesions of another localizations.

#### Effect of T.B. on Pregnancy

1. Abortion or premature labour rarely occur in acute febrile cases.

2. The infant is usually not affected as it is extremely rare for tubercle bacilli to cross the placenta.

No effect on the course of the disease.

Diagnosis

suggesting symptoms.

a. X-ray chest after shielding the uterus from irradiation.

b. Bacteriological examination for the sputum.

#### Management

##### Antenatal care

Chemotherapy: isoniazid 300 mg orally and ethambutol 15mg/ kg orally for 9 months.

Induction of abortion: active disease itself is not an indication for termination of pregnancy, but if there is gross respiratory impairment or the patient cannot tolerate the drugs because of excessive vomiting it may be indicated.

##### Management>Labour

Isolate the patient with active disease,

give oxygen,

avoid inhalation anaesthesia,

shorten the second stage,

avoid excessive blood loss.

##### Management>Neonate

Breast feeding is contraindicated only for the infants of patients with active disease who should be isolated.

Neonate should be given isoniazid and vaccinated with isoniazid-resistant BCG and returned to his mother when he/she is tuberculin positive (2-10 weeks).

#### TOXOPLASMOSIS

Causative Parasite: Toxoplasma gondii.

Method of Transmission: It is believed to be cats faeces and uncooked meat or by transfer across the placenta.

Clinical Features: usually asymptomatic although fever, muscle pain and lymphadenopathy may occur.

#### Complications

They occur only if there is acute exacerbation during pregnancy. This may lead to abortion or a live birth with the following manifestations which may develop weeks or months after birth:

>Convulsions,

>intracranial calcification,

chorioretinitis,

>hydrocephalus or microcephaly,

>hepatosplenomegaly,

>jaundice and

>anaemia.

Diagnosis

Detection of specific IgM

Treatment

Spiramycin 3 gm/day for 3-4 weeks

**43. The course and management of an accompanying gynecological pathology in different terms of pregnancy: myoma, ovarian neoplasms. Methods of treatment.**

**44. The etiology, classification, diagnosis and prevention of breech presentation.**

2. Breech presentation or podalic:-

when buttock of fetal occupies the lower segment of uterus, it is called breech presentation.

Types of breech:-

1. Full/Complete Breech:- arms & legs flexed

When the thighs are flexed and the legs extended over the anterior surfaces of the body, this is termed a frank breech presentation. If the thighs are flexed on the abdomen and the legs upon the thighs, this is a complete breech presentation.

2. Incomplete Breech

If the thighs are flexed on the abdomen and the legs upon the thighs, this is a complete breech presentation.

3. Frank Breech:- arms flexed but legs extended straight up over head

When the thighs are flexed and the legs extended over the anterior surfaces of the body, this is termed a frank breech presentation.

4. Footling Breech:- one or both feet extended downward and may exit the birth canal first.

If one or both feet, or one or both knees, are lowermost, then there is an incomplete, or footling, breech presentation.

In Breech presentation - 6 position

1. Sacro - anterior:-

Right

Left

Direct

2. Sacro- posterior:-

Right

Left

Direct

A breech presentation at delivery occurs when the fetus does not turn to a cephalic presentation. This failure to change presentation can result from endogenous and exogenous factors. Endogenous factors involve fetal inability to adequately move, whereas exogenous factors refer to insufficient intrauterine space available for fetal movements.

Incidence of breech presentation among diseases and medical conditions with the incidence of breech presentation higher than occurs in the general population, shows that the probability of breech presentation is between 4% and 50%. These data are related to:

1. single series of medical entities;
2. collections of series for some particular medical entity;
3. data obtained from repeated observations under the same conditions;
4. series of two concomitant medical conditions.

In subsequent pregnancies

\_In pregnancies of multiples

\_When there is history of premature delivery

\_When the uterus has too much or too little amniotic fluid

\_When there is an abnormal shaped uterus or a uterus with abnormal growths, such as fibroids

\_With women who have placenta previa

#### How Is A Breech Presentation Diagnosed?

A few weeks prior to the due date, the health care provider will place her hands on the mother's lower abdomen to locate the baby's head, back, and buttocks. If it appears that the baby might be in a breech position, they can use ultrasound to confirm the position.

Special x-rays can also be used to determine the baby's position and the size of the pelvis to determine if a vaginal delivery of a breech baby can be safely attempted. Ultrasound confirm the diagnosis.

## **Prevention**

It is preferable to try to turn a breech baby between the 32nd and 37th weeks of pregnancy. The methods of turning a baby will vary and the success rate for each method can also vary. It is best to discuss the options with the health care provider to see which method she recommends.

## **Medical techniques**

**External Version:** External version is a non-surgical technique to move the baby in the uterus. In this procedure, a medication is given to help relax the uterus.

**Chiropractic Care:** The late Larry Webster, D.C., of the International Chiropractic Pediatric Association, developed a technique that enabled chiropractors to reduce stress on the pregnant woman's pelvis leading to the relaxation of the uterus and surrounding ligaments

## **Natural Techniques**

The following risk-free techniques, often suggested by physical therapist Penny Simkin, can be tried at home for free:

**The Breech Tilt:** Using large, firm pillows, raise the hips 12" or 30cm off the floor for 10-15 minutes, three times a day. It is best to do this on an empty stomach when your baby is active. In this technique, try to concentrate on the baby without tensing your body, especially in the abdominal area.

**Using Music:** We know that babies can hear sounds outside the womb

## **45. Management of pregnancy with breech presentation, gestational complications during pregnancy,**

Breech presentation occurs in three to four per cent of term deliveries and is more common in nulliparous women.

External cephalic version (ECV) from 37 weeks has been shown to decrease the incidence of breech presentation at term and the subsequent elective caesarean section (ELCS) rate.

Vaginal breech birth increases the risk of low Apgar scores and more serious short-term complications, but evidence has not shown an increase in long-term morbidity.

Emergency caesarean section (EMCS) is needed in approximately 40 per cent of women planning a vaginal breech birth.

Perinatal mortality by mode of birth:

0.5/1000 with ELCS for breech >39 weeks gestation

2.0/1000 planned vaginal breech birth >39/40

1.0/1000 with planned cephalic birth.

A reduction in planned vaginal breech birth followed publication of the Term Breech Trial (TBT) in 2001.

Acquisition of skills necessary to manage breech presentation (for example, ECV) is important to optimise outcomes.

## Management

### Practice points

Offer ECV if there are no contraindications.

If ECV is declined or unsuccessful, provide counselling on risks and benefits of a planned vaginal birth versus an ELCS.

Inform the woman that there are fewer maternal complications with a successful vaginal birth, however the risk to the woman increases significantly if there is a need for an EMCS.

Inform the woman that caesarean section increases the risk of complication in future pregnancies, including the risk of a repeat caesarean section and the risk of invasive placentation.

If the woman chooses an ELCS, document consent and organise booking for 39 weeks gestation.

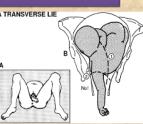
### 46. The pregnancy and labor in shoulder presentation and oblique lie of the fetus

#### . Shoulder presentation:-

when shoulder of baby comes in the lower segment of uterus, it is called shoulder presentation.

<p><b>Shoulder presentation</b></p> <p>❑ It is a Transverse lie in which the long axis of the fetus is perpendicular( 90°) to long axis of mother. ❖ Shoulder of baby comes in - the lower segment of uterus(0.5%)</p> 	<p><b>4 position in Shoulder presentation</b></p> <p>❑ Acrimon- anterior(60%) ➢ Left ➢ Right ❑ Acrimo- posterior(40%) ➢ Right ➢ Left ✓ Acrimo anterior position is more common as the concavity of front of fetus fix in convexity of maternal spine ✓ Placenta is posterior in 60% of cases</p>
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<p><b>Diagnosis</b></p> <p>❑ Abdominal examination, ➢ the head is usually felt in one iliac fossa or in the flank.  ➢ The breech in the other iliac fossa but at a higher level  ➢ Fundal level just above umbilicus  ➢ FH sound heard below the umbilicus</p> 	<p><b>On vaginal examination</b></p> <p>❑ Early in labor ➢ the cervix is elevated ➢ lower uterine segment is imperfectly filled ❑ Late in labor ➢ The cervix is sufficiently dilated: We can feel: scapula, acromion, clavicle, axilla and ribs ❑ Confirm position: If the arm is prolapsed and supinated the dorsum points to the back and the thumb points to the head.</p> 
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<p><b>Neglected shoulder</b></p> <p>➢ Prolonged labor ➢ Membrane ruptured ➢ liquor drained ➢ Arm may be prolapse ➢ Fetus dead or dying ➢ Lower segment overstretched ➢ Signs and symptoms of obstructed labor</p> 	<p><b>Management</b></p> <p><b>During pregnancy</b></p> <p>➢ A-External cephalic version ➢ Can be tried up to full term, ➢ Even early in labour before ROM</p> <p>➢ * Laxity of the abdominal &amp; uterine walls makes the procedure easier than in breech ➢ * The fetus will be rotated only 90 degrees.</p> <p>➢ B. If fails, do external podalic version. head.</p>
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During labor	Management
<ul style="list-style-type: none"> <li>➤ External cephalic version (ECV) is tried with intact membranes:</li> <li>➢ If succeeded: Rupture of membranes and application of abdominal binder.</li> <li>➢ If failed: C.S. is the safest for the mother &amp; fetus.</li> </ul> <p>□ If the membranes are ruptured before full cervical dilatations do C.S.</p>	<ul style="list-style-type: none"> <li>□ In modern practice, persistent transverse lie in labor is delivered by caesarean section whether the fetus is alive or dead</li> </ul>

Oblique:-

When the long axis of fetus crosses the maternal long axis obliquely at an angle other than right angle.

A baby is oblique when the baby's head is in the mother's hip. The baby's body and head are diagonal, not vertical and not horizontal (transverse lie).

Oblique is considered a malposition. I've heard from a number of women with oblique babies that these are helpful:

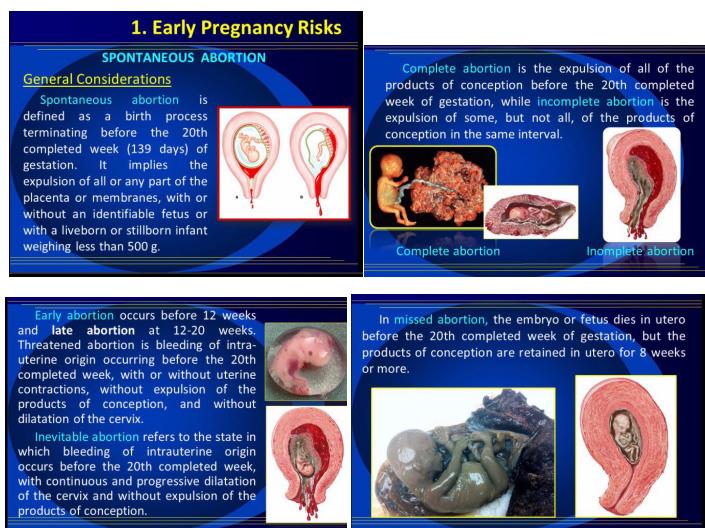
Forward-Leaning Inversion

Sidelying (Pelvic Floor) Release

Dip the Hip

#### 47. Incomplete pregnancy: etiology, pathogenesis, classification.

#### 48. Clinical stages of the spontaneous abortion, diagnosis and treatment.

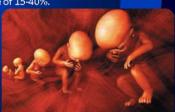


**Infected abortion** is abortion associated with infection of the genital organs and is contrasted to **septic abortion**, in which there is infected abortion with dissemination of infection through the maternal circulation.

In **subclinical (undiagnosed) spontaneous abortion**, the pregnancy is resorbed or aborted before the pregnancy has been recognized.

Spontaneous abortion generally occurs 1-3 weeks after the death of the embryo or fetus.

- > In the spectrum of reproductive wastage, **spontaneous abortion** is probably the largest single contributor, with an incidence of 15-40%.
- > Infertility (15%),
- > Prematurity (10%)
- > Fetal death (1%),
- > Ectopic pregnancy (1%),
- > Neonatal death (1%).



**Etiology**

Most spontaneous abortions are associated with abnormal products of conception and occur prior to clinical evidence of pregnancy.

- ✓ 15% are lost before implantation (first week of gestation).
- ✓ Approximately 25% are lost during implantation (second week of gestation).
- ✓ 10% are lost following the first missed menses.
- ✓ In about 60% of spontaneous abortions occurring during the first trimester, there is an abnormal karyotype (about half are aneuploid and half are euploid).
- ✓ At least 10% of human conceptions are thought to have chromosomal abnormalities.
- Other causes of spontaneous abortion account for a smaller percentage of losses, with the next largest category after genetic abnormalities being "unknown."

Other known factors include, in descending order of incidence:

- infection,
- anatomic defects (e.g. maternal müllerian defects),
- endocrine factors (probably related to failure of the corpus luteum),
- immunologic factors (currently under active investigation),
- maternal systemic disease (e.g. diabetes mellitus, hyperthyroidism).

**A. Ovarian Factors:** Ovarian factors that cause spontaneous abortion, most often in the first trimester, include the following:

1. First trimester
  - Gross anomaly of the chromosome structure, most commonly X monosomy, trisomy, and polyploidy.
  - Abnormal formation of the placenta, e.g. hypoplastic trophoblast.
  - Localized anomaly of the embryo.
  - Congenital absence of the embryo or of the chorionic cavity.
2. Second trimester
  - The major fetal causes of abortion are syphilis and shallow circumvallate implantation of the placenta (hydatidiform mole) and other fetal anomalies are less frequently responsible.

**B. Maternal Factors:** Maternal factors cause spontaneous abortion more frequently in the late first or second trimester. Representative problems are as follows:

1. Systemic disease
  - Maternal infections, e.g. with herpes simplex virus type 2, rubella virus, Chlamydia, T strain Mycoplasma, *Toxoplasma gondii*, and cytomegalovirus. Syphilis is a rare cause and brucellosis is a questionable cause of human abortion.
  - Endocrine disorders, e.g. hyper- or hypothyroidism, diabetes mellitus.
  - Cardiovascular-renal hypertensive disease.
  - Connective tissue diseases, e.g. lupus erythematosus.

2. Physical and vitamin undernutrition

3. Immunologic disorders

▪ Blood group incompatibility due to ABO, Rh, Kell, or other less common factor systems.

▪ Similar maternal and paternal HLA may enhance the possibility of abortion by causing insufficient maternal immunologic recognition of the fetus.

▪ Several methods of analysis indicate a depressed immunologic response in mothers who have habitual abortions.

4. Environmental factors:
  - such as thalidomide, folic acid antagonists, anticoagulants, lead poisoning (organomercury compound), maternal hypoxia
  - 5. Uterine defects:
    - Congenital anomalies that distort or reduce the size of the uterine cavity.
    - Uterine tumors, particularly submucous or intramural myomas.
    - Uterine malposition, especially with retroflected uterine orientation (rare).
    - Previous uterine surgery, e.g. previous uterine curettage, uterine resection, tubal ligation procedures, or cesarean section.
    - Asherman's syndrome of uterine scarring from previous uterine surgery.
    - Anatomic or functional incompetence of the uterine cervix as a result of previous pregnancies and lacerations.
    - Cervical second-trimester abortion. Uterine anomalies may also be responsible for first- or second-trimester abortion.
  - 6. Psychiatric or emotional causes
    - Psychiatric or emotional causes of abortion are speculative. There is no valid evidence to support the concept that abortion may be induced by psychic stimuli such as fright, grief, anger, or anxiety.

**C.Trauma:**

**Direct-** Local injury to the pregnant uterus, especially penetrating wounds or steering wheel or seat belt injury in midtrimester pregnancy.

**Indirect-** Examples include surgical trauma (e.g. кесарево), removal of an ovary containing the corpus luteum of pregnancy, appendectomy) and electric shock (lightning or power line contact).

**Clinical Findings:**

Threatened abortion is not a disease entity. The preivable pregnancy may be in jeopardy, but pregnancy continues. The cervix remains closed, although slight bleeding or cramping may be noted.

**A. Symptoms and Signs:**

The clinical classification of abortion is as shown below. Any of the following types may be septic.

### SPONTANEOUS ABORTION

**1. Inevitable abortion**

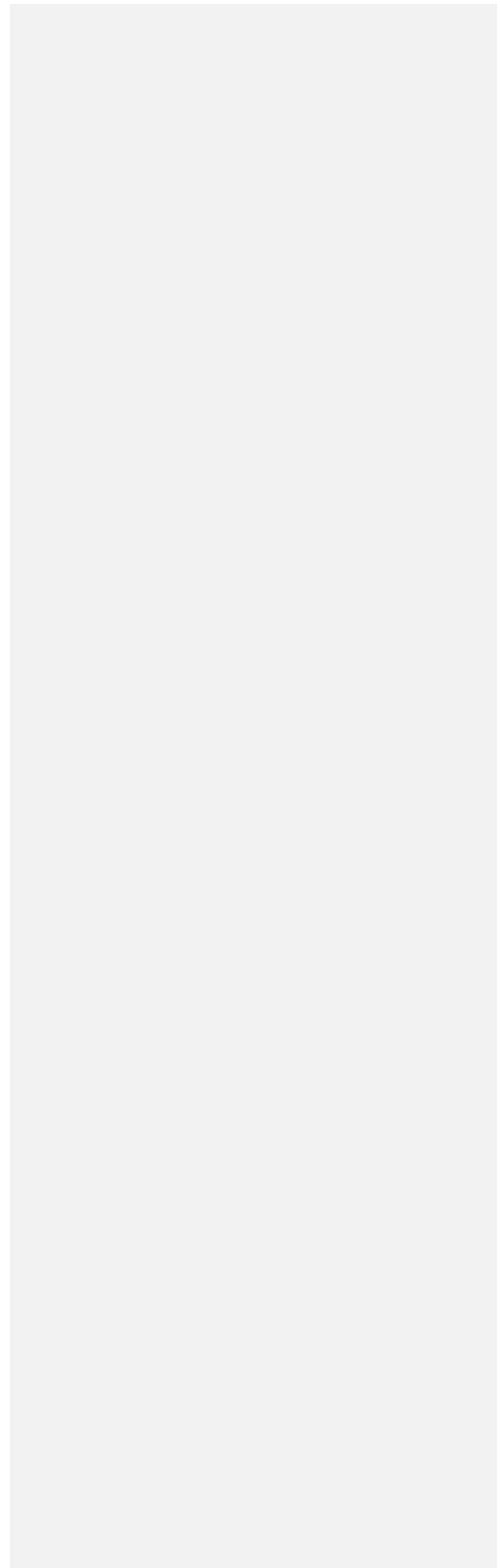
Pain and bleeding with an open cervix indicate impending abortion, and the expulsion of the uterine contents is imminent. Abortion is inevitable when 2 or more of the following are noted:

- moderate effacement of the cervix,
- cervical dilation greater than 3 cm,
- rupture of the membranes,
- bleeding for more than 7 days,
- persistence of cramps despite narcotic analgesics,
- signs of termination of pregnancy.

Fever and generalized pelvic discomfort indicate infection. Retained tissue is evidenced by continued bleeding, a patulous cervix, and an enlarged, boggy uterus.

**2. Incomplete abortion**

This is a disorder in which the products of conception have partially passed from the uterine cavity. Cramps are usually present but may not be severe. Bleeding generally is persistent and is often severe enough to constitute frank hemorrhage.



**B. Complete abortion**

Is identified by cessation of pain and brisk bleeding after the entire conceptus has been passed. Slight bleeding may continue for a short time. When complete abortion is impending, the symptoms of pregnancy often disappear and sudden bleeding begins, followed by cramping. The fetus and the placenta may be expelled separately. When the entire conceptus has been expelled, pain ceases but slight spotting persists. It is important that the conceptus be very carefully examined for completeness and trophoblastic disease.

**4. Missed abortion**

**5. Therapeutic induced abortion**

(is accomplished for therapeutic or elective termination of pregnancy. Mifepristone, Misoprostol).

**3. Other hormones**

With the possible exception of hypothyroidism, only the most extreme deficiencies in hormone secretion ever cause abortion.

The greatest source of estrogen in early pregnancy is the trophoblast; a small amount is secreted by the ovary. A falling blood or urine estrogen level may signify impending abortion.

During the first trimester, the principal source of progesterone is the corpus luteum. Thereafter, the principal source is the chorionic/placental system. Pregnenediol (the major catabolite of progesterone) and serum progesterone drop precipitously in abortion. A small number of abortions appear to be due to a chronic luteal defect and inadequate production of progesterone.

**4. Vaginal smears**

The incidence of spontaneous abortion is related directly to the percentage of karyopyknotic cells in the vaginal smear obtained from the upper lateral vaginal wall.

**C. Ultrasonography:**

Ultrasonography is highly accurate in diagnosing impending spontaneous abortion and is being used increasingly, especially by the vaginal route.

**D. X-Ray Findings:**

X-rays are of no value in diagnosis of early abortion. In advanced missed abortion, x-rays may reveal a distorted fetal skeleton and intravascular gas in the fetus.

**Differential Diagnosis**

- Ectopic pregnancy
- Membranous dysmenorrhea
- Hypoestrogenism
- Hydatidiform mole
- Other entities that may be confused with abortion include extruding pedunculated myoma and cervical neoplasia (polyps, carcinoma, etc.).

**Prevention**

Cerclage closure of an incompetent cervix is effective in prevention of midtrimester abortion.

Correction of cervical incompetence in the nonpregnant patient (after Bell). A: Bladder displaced upward, exposing cervix. B: Cervix sutured with a cerclage. C: Sutured cervix. (From Cunningham FG, ed: Williams Obstetrics, 22nd ed, New Haven, 1985, Appleton-Century-Crofts.)

Many abortions can be prevented by study and treatment of maternal disorders before pregnancy; by early obstetric care, with adequate treatment of maternal disorders such as diabetes and hypertension; and by protection of pregnant women from environmental hazards to health and from exposure to rubella or other infectious diseases.

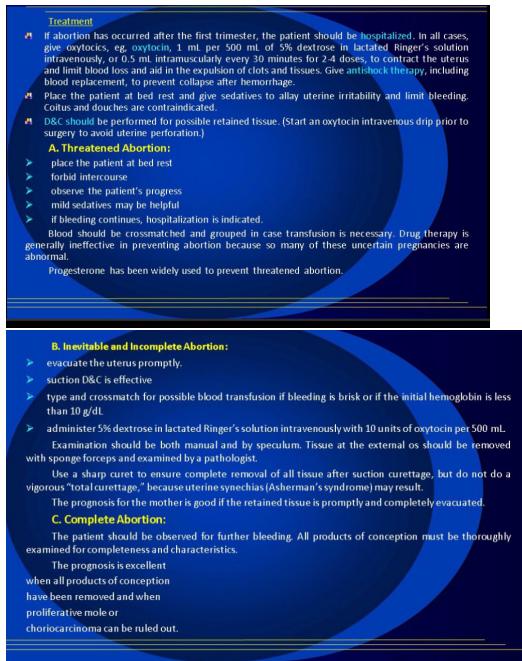
**B. Laboratory Findings:**

**1. Pregnancy tests**

Chorionic gonadotropin is produced by the syncytiotrophoblast. Falling or abnormally low plasma levels of  $\beta$ -hCG are predictive of spontaneous abortion.

**2. Blood**

If significant bleeding has occurred, blood studies will indicate anemia. If infection is present, the white blood cell count will be elevated (12,000–20,000/ $\mu$ L). The sedimentation rate, already elevated by pregnancy, increases with infection and anemia.



#### 49. Threatened premature (preterm) labor: diagnosis, clinical signs, treatment

Commented [y1]:

Signs and symptoms of preterm labor include:

Regular or frequent sensations of abdominal tightening (contractions)

Constant low, dull backache

A sensation of pelvic or lower abdominal pressure

Mild abdominal cramps

Vaginal spotting or light bleeding

Preterm rupture of membranes — in a gush or a continuous trickle of fluid after the membrane around the baby breaks or tears

A change in type of vaginal discharge — watery, mucus-like or bloody

Tests and procedures to diagnose preterm labor include:

-Pelvic exam

-Ultrasound

-Uterine monitoring

-Lab tests

Treatment:

#### Medications

Once you're in labor, there are no medications or surgical procedures to stop labor. However, your doctor might recommend the following medications:

-Corticosteroids

-Magnesium sulfate

-Tocolytics: temporary stop contraction

#### Surgical procedures

For some women, a surgical procedure known as cervical cerclage can help women who develop preterm labor because of a short cervix. During this procedure, the cervix is stitched closed with strong sutures. Typically, the sutures are removed after 36 completed weeks of pregnancy. If necessary, the sutures can be removed earlier.

Cervical cerclage might be recommended if you're less than 24 weeks pregnant, you have a history of early premature birth and an ultrasound shows that your cervix is opening or that your cervical length is less than 25 millimeters.

#### 50. Diagnosis, complications and management of premature (preterm) labor.

- Preterm births are birth that occur in the period of 22 - 37 weeks of pregnancy and end by the birth of a premature infant weighing from 500 to 2499 gr. and 25 - 44 cm tall showing signs of premature birth.

- Preterm birth has a number of features:
  - Early and premature rupture of fluids is a frequent complication of preterm birth
  - Anomalies of labor activity
  - Quick and rapid labor at cervical incompetence or prolonged labor as a result of endocrine mechanisms unpreparedness
- Falling out of the umbilical cord loops, hypoxia of the fetus and birth injuries of the fetus
- Infectious complications in childbirth (chorioamnionitis) and postpartum period (endometritis, flebitis)
- Bleeding after birth and in early postnatal periods

#### Management of Preterm Birth

Strategy for the management of preterm birth is determined by:

- stage of preterm birth
- gestation period
- condition of mother and fetus
- state of cervix
- state of membranes
- nature of birth activity
- complications arising in childbirth

#### I. Active Wait-and-See Tactics Aimed at Prolongation of Pregnancy

- duration of pregnancy is up to 36 weeks
- undisrupted amniotic fluid
- satisfactory condition of mother and fetus
- opening of cervix up to 2-3 cm
- no signs of infection and severe extragenital pathology
- lack of regular labor activity

#### II. Active Tactics Aimed at Delivery

- adequate anesthesia including pudendal anesthesia
- labor activation by prostaglandins
- prevention of hypoxia and respiratory distress syndrome
- treatment by antibiotics if there are signs of infection
- management of labour without the protection of the perineum; timely perineotomy or episiotomy
- Caesarean section recommended after 34 - 36 weeks of pregnancy

#### 51. Anatomical and physiological characteristics of an immature baby.

### Signs of Fetus Immaturity

- body weight less than 2500 g; body length less than 45 cm
- excess of vernix caseosa
- insufficient development of subcutaneous fat
- lanugo hair (as a norm on shoulders)
- small head hair
- soft ear and nasal cartilage
- nails do not reach fingertips
- umbilical ring is located closer to pubic symphysis
- boys' testicles are not in the scrotum
- girls' clitoris and labia minora is not covered by large ones
- child weeps weekly and squeakily

### The Most Common Complications of Premature Births

The risk of complications increases the earlier the baby is born. Any complication that a premature newborn experiences will be treated in the neonatal intensive care unit (NICU).

#### -Immature Lungs

Immature lungs are associated with the following complications: Respiratory Distress Syndrome (RDS), Transient tachypnea, Bronchopulmonary Dysplasia (BPD), Pneumonia, Apnea and bradycardia

#### -Infection

#### -Jaundice

#### -Intraventricular hemorrhage (IVH)

#### -Inability to maintain body heat

#### -Immature gastrointestinal and digestive system

#### -Anemia

-Patent Ductus Arteriosus (PDA) – This is a cardiac disorder that results in breathing difficulties after delivery because of an open blood vessel called the ductus arteriosus

#### -Retinopathy of Prematurity (ROP)

#### -Necrotizing Enterocolitis (NEC)

#### -Sepsis

### 52. Prolonged pregnancy: etiology, pathogenesis, diagnosis, prevention, the management of pregnancy.

LATE PREGNANCY	Late Pregnancy	Prolonged Pregnancy
<ul style="list-style-type: none"><li>Major late pregnancy problems are perinatal mortality and neonatal diseases</li><li>It is advisable to distinguish true (biological) and imaginary (physiological or chronological) prolonged gestation or pregnancy</li></ul>	<ul style="list-style-type: none"><li>Late pregnancy is pregnancy that lasts more than 10 - 14 days after the expected date of childbirth (in total more than 290 - 294 days). Fetus is born with signs of postdate gestation (Ballentine-Runge syndrome). Its life is in danger. There are pathological changes in placenta</li></ul>	<ul style="list-style-type: none"><li>Prolonged pregnancy is pregnancy that lasts more than 290 - 294 days and ends with a full-term birth. Infant is mature and there are no signs of postdate gestation in placenta</li><li>Antenatal diagnosis is of particular importance as obstetric tactics are different</li></ul>

<b>Prolonged Pregnancy (continuation)</b>	<b>THE ETIOLOGY AND PATHOGENESIS OF LATE PREGNANCY</b>	<b>Clinical Symptoms of Late Pregnancy Detected after Delivery</b>
<ul style="list-style-type: none"> <li>■ Frequency ranges from 2% to 20%</li> <li>■ Frequency of fetal death is: 1,1 % in pregnancy of 40 - 41 weeks; 2,2 % in pregnancy of 43 weeks; 6,5 % in pregnancy of 44 weeks or more.</li> <li>■ Mortality in meconium aspiration syndrome reaches 60 %</li> <li>■ Transferred hypoxia leads to perinatal lesions of the central nervous system which account for 60 to 80 % of all nervous system diseases in children</li> </ul>	<ul style="list-style-type: none"> <li>■ I. Sociobiological factors</li> <li>■ II. Medical factors:</li> <li>■ Neuroendocrine disturbances of hypothalamic and pituitary system</li> <li>■ Hypothalamic-pituitary-endocrine glands</li> <li>■ Meconium pathology in pregnant women, immunological disorders in mother-placenta-fetus system</li> <li>■ Malformations of fetus central nervous system</li> <li>■ Infectious factors</li> <li>■ Extragenital pathology leading to hypoxia in mother</li> <li>■ Complications in gestation</li> <li>■ Anatomical and functional changes of genital organs</li> <li>■ Genetic predisposition</li> </ul>	<p>Signs of postdate fetus (Ballantine-Runge syndrome):</p> <ul style="list-style-type: none"> <li>■ weak development of subcutaneous tissue; decreased skin turgor (dermataxis senile)</li> <li>■ dry skin, wrinkled and aged skin; maceration of the skin in short postdate gestation (child alive), especially on hands and feet</li> <li>■ greenish color of skin caused by meconium</li> <li>■ irregular skin folds</li> <li>■ little or no vermicles caseosa (usually in the neck and inguinal folds)</li> <li>■ long fingernails</li> <li>■ poorly expressed configuration of head, thick skull bones, narrow seams and little fontanelles</li> <li>■ large size of fetus (rarely small-for-gestation age)</li> </ul>
<b>DIAGNOSTICS OF POSTDATE PREGNANCY</b>		<b>CLINICAL MANAGEMENT OF PREGNANCY AND CHILDBIRTH</b>
<ul style="list-style-type: none"> <li>■ Diagnosis of postdate pregnancy is usually based on medical history, clinical, laboratory and instrumental methods. Diagnosis is confirmed after birth during the examination of child and placenta</li> <li>■ Important and topical issue nowadays is antenatal differential diagnosis of true postdate and prolonged pregnancy. It is associated with various obstetric tactics of management of these two types of pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>■ History</li> <li>■ Objective examination of pregnant woman</li> <li>■ Clinical and laboratory examinations: <ul style="list-style-type: none"> <li>1. Cytological examination of vaginal cells</li> <li>2. Amnioscopy every 2 days</li> <li>3. Examination of amniotic fluid</li> <li>4. Hormonal tests</li> <li>5. Cardiotocography: monotony of rhythm</li> <li>6. Dynamic integrated ultrasound examination</li> </ul> </li> </ul>	<p>Labor should be induced:</p> <ul style="list-style-type: none"> <li>1. Late pregnancy (gt. 6%)</li> <li>2. Oligohydramnios (21,6 %)</li> <li>3. Presence of amniotic meconium fluid (25,9 %)</li> <li>4. Hypertensive syndrome (30,6 %)</li> <li>5. The intrauterine fetal growth is decreased (6,9 per cent)</li> <li>6. Chronic hypoxia</li> <li>7. Rhesus negative blood in pregnant woman in presence of chorioamnionitis</li> <li>8. Diabetes and other extragenital diseases that complicate pregnancy and can't be treated by therapy</li> </ul>
<b>In the Case of Immature and Not Mature Enough Cervix Obstetricians Use:</b>	<b>In the Case of Mature Cervix</b>	<b>Indications for Planned Caesarean Section in Late Pregnancy:</b>
<ul style="list-style-type: none"> <li>■ The medical method</li> <li>■ Prostaglandins</li> <li>■ The non-medical methods: <ul style="list-style-type: none"> <li>1. Use of <i>see weeds</i> (laminaria)</li> <li>2. Electrostimulation of cervix</li> <li>3. Stimulation of mammary glands</li> <li>4. Intruterine catheter of Foley №17</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Separation of fetus shells (detachment by fingers) from lower segment of uterus;</li> <li>■ Amniotomy;</li> <li>■ Drugs causing uterine contractions (oxytocin and prostaglandins).</li> </ul>	<ul style="list-style-type: none"> <li>1. Aged primipara</li> <li>2. Pelvic presentation of fetus</li> <li>3. Large fetus</li> <li>4. Chronic intrauterine hypoxia</li> <li>5. Anatomically narrow pelvis</li> <li>6. Aggravated obstetric anamnesis (infertility, complications during previous birth, stillbirth, and others)</li> <li>7. Scar on uterus</li> <li>8. Complications during this particular pregnancy</li> </ul>
<b>PREVENTION OF POSTDATE PREGNANCY</b>	<b>PREVENTION OF POSTDATE PREGNANCY</b>	
<ul style="list-style-type: none"> <li>1. Adequate physical and psychological development in girls especially during puberty to ensure timely and proper development of physiological functions of the body</li> <li>2. Dispersary observation of pregnant women at risk for postdate pregnancy</li> <li>3. Timely admission to hospital for examination</li> <li>4. Balanced diet rich in vitamins especially Vitamin B</li> </ul>	<ul style="list-style-type: none"> <li>5. Conducting physiotherapeutic childbirth preparation, electroanalgesia (6 - 8 sessions)</li> <li>6. Comprehensive ultrasound examination of women at high risk of postdate pregnancy starting at 40 weeks of pregnancy to prevent adverse perinatal outcomes</li> <li>7. In real postdate pregnancy obstetricians use active clinical management</li> </ul>	

### 53. The diagnosis, course and management of delayed labor.

#### What Is Prolonged Labor?

Sometimes, labor stalls or occurs much too slowly. Prolonged labor may also be referred to as "failure to progress."

Prolonged labor can be determined by labor stage and whether the cervix has thinned and opened appropriately during labor. If your baby is not born after approximately 20 hours of regular contractions, you are likely to be in prolonged labor. Some health experts may say it occurs after 18 to 24 hours.

If you are carrying twins or more, prolonged labor is labor that lasts more than 16 hours.

Your doctor may refer to slow labor as "prolonged latent labor."

Prolonged labor may happen if:

The baby is very big and cannot move through the birth canal.

The baby is in an abnormal position. Normally, the baby is head-down facing your back.

The birth canal is too small for the baby to move through.

Your contractions are very weak.

Diagnosis:

The medical team will check:

How often you have contractions.

The strength of your contractions.

The following tests may be done:

-Intrauterine Pressure Catheter Placement (IUPC)

-Continuous electronic fetal monitoring (EFM) to measure the baby's heart rate.

How Is Prolonged Labor Treated?

If your labor is going slowly, you may be advised to just rest for a little while. Sometimes medicine is given to ease your labor pains and help you relax. You may feel like changing your body position to become more comfortable.

Additional treatment depends on why your labor is going slowly.

If the baby is already in the birth canal, the doctor or midwife may use special tools called forceps or a vacuum device to help pull the baby out through the vagina.

If your doctor feels like you need more or stronger contractions, you may receive Pitocin (oxytocin). This medicine speeds up contractions and makes them stronger. If after your doctor feels like you are contracting enough and the labor is still stalled, you may need a C-section.

If the baby is too big, or the medicine does not speed up delivery, you will need a C-section.

#### **54. Anatomical and physiological characteristic of an overmature baby.**

The normal length of pregnancy is from 37 to 41 weeks. Postmaturity refers to any baby born after 42 weeks gestation or 294 days past the first day of the mother's last menstrual period. Less than 6 percent of all babies are born at 42 weeks or later. Other terms often used to describe these late births include post-term, postmaturity, prolonged pregnancy, and post-dates pregnancy

What are the symptoms of postmaturity in the newborn?

Each baby may show different symptoms of postmaturity. Some of those symptoms are:

Dry, loose, peeling skin

Overgrown nails

Large amount of hair on the head  
Visible creases on palms and soles of feet  
Small amount of fat on the body  
Green, brown, or yellow coloring of skin from baby passing stool in the womb  
More alert and "wide-eyed"  
Symptoms of postmaturity sometimes look like other health conditions. Make sure your child sees his or her healthcare provider for a diagnosis.

How is postmaturity in the newborn diagnosed?

Your baby's healthcare provider will check:

- Your baby's physical appearance
- The length of your pregnancy
- How old your baby appears to be

Complications

Postmature infants have higher morbidity and mortality than term infants due in large part to

-Perinatal asphyxia

-Meconium aspiration syndrome

Perinatal asphyxia may result from placental insufficiency as well as cord compression secondary to oligohydramnios.

Meconium aspiration syndrome may be unusually severe because amniotic fluid volume is decreased and thus the aspirated meconium is less dilute. Persistent pulmonary hypertension often occurs after meconium aspiration.

Neonatal hypoglycemia is a complication caused by insufficient glycogen stores at birth. Because anaerobic metabolism rapidly uses the remaining glycogen stores, hypoglycemia is exaggerated if perinatal asphyxia has occurred.

##### **55. The etiology, pathogenesis, classification and methods of diagnosing early pregnancy hemorrhages.**

Early pregnancy bleeding refers to bleeding before 24 weeks of gestational age. Complications may include hemorrhagic shock. Concerns are increased in those who have had a loss of consciousness, are short of breath, or have pain in their shoulder.

Causes of first trimester bleeding include:

Abortion (spontaneous), also referred to as miscarriage. One study came to the result that the risk of miscarriage during the course of the pregnancy with just spotting during the first trimester was 9%,

and with light bleeding 12%, compared to 12% in pregnancies without any first trimester bleeding. However, heavy first trimester bleeding was estimated to have a miscarriage risk of 24%.

#### Gestational trophoblastic neoplasia

Ectopic pregnancy, which implies a pregnancy outside the uterus, commonly in the fallopian tube, which may lead to bleeding internally that could be fatal if untreated. In cases where there is heavy bleeding and an obstetric ultrasonography assists in diagnosing a pregnancy of unknown location (no visible intrauterine pregnancy), it has been estimated that approximately 6% have an underlying ectopic pregnancy.

#### Implantation bleeding

#### Chorionic hematoma

#### Spotting

#### Lower GU tract causes

#### Vaginal bleed

#### Cervical bleed

Other causes of early pregnancy bleeding may include:

Postcoital bleeding, which is vaginal bleeding after sexual intercourse that can be normal with pregnancy

Iatrogenic causes, or bleeding due to medical treatment or intervention, such as sex steroids, anticoagulants, or intrauterine contraceptive devices Infection

#### Complication

#### Hemorrhagic shock

#### Diagnostic\_method

Speculum, examination, ultrasound, HCG

#### 56. Placental presentation (placenta previa): etiology, pathogenesis, classification,

clinical features, diagnosis, management of pregnancy and labor.



##### Essentials of Diagnosis

- Spotting during first and second trimesters.
- Sudden, painless, profuse bleeding in third trimester.
- Initial cramping in 10% of cases.

**General Considerations**

In placenta previa, the placenta is implanted in the lower uterine segment within the zone of effacement and dilatation of the cervix, thus constituting an obstruction to descent of the presenting part. Placenta previa is encountered in approximately one in 200 births, but only 20% are total (placenta over the entire cervix). About 90% of patients will be parous. Among grand multiparas the incidence may be as high as one in 20. Placenta previa may also be involved in up to 5% of spontaneous abortions, although its presence usually is not recognized.

**Etiology**

The incidence of placenta previa is increased by advancing age, multiparity, and previous cesarean delivery. Thus, possible etiologic factors include scarred or poorly vascularized endometrium in the corpus, a large placenta, and abnormal forms of placentation such as succenturiate lobe or placenta diffusa.

**Bleeding in placenta previa may be due to any of the following causes:**

- Mechanical separation of the placenta from its implantation site, either during the formation of the lower uterine segment or during effacement and dilatation of the cervix in labor, or as a result of intravaginal manipulation.
- Placental.
- Rupture of poorly supported venous lakes in the decidua basalis that have become engorged with venous blood.

**Diagnosis**

Every patient suspected of placenta previa should be hospitalized and at least 3 units of cross-matched blood should be at hand. Unless these precautions are taken, there is always the danger that vaginal manipulation may provoke an uncontrollable, fatal hemorrhage.

**A. Symptoms and Signs:**

Painless hemorrhage is the cardinal sign of placenta previa. Clothing or bedding is soaked by an impressive amount of bright red, clotted blood, but the blood loss usually is not extensive, seldom produces shock, and is almost never fatal. In about 10% of cases there is some initial pain because of coexisting placental abruption, and spontaneous labor may be expected over the next few days in 25% of patients.

**Treatment**

The initial treatment given depends on the amount of uterine bleeding: the duration of pregnancy and viability of the fetus; the degree of placenta previa; the presentation, position, and station of the fetus; the gravidity and parity of the patient; the status of the cervix; and whether or not labor has begun.

The patient must be admitted to the hospital to establish the diagnosis and ideally should remain in the hospital once the diagnosis is made. Two or more units of bank blood should be typed, cross-matched, and ready for transfusion.

**A. Expectant Therapy:**

Early in pregnancy, transfusions to replace blood loss and the use of tocolytic agents to prevent premature labor are indicated to prolong pregnancy to at least 36 weeks. After 36 weeks, the benefits of additional maturity must be weighed against the risk of major hemorrhage. The possibility that repeated small hemorrhages may be accompanied by intrauterine growth retardation must also be considered.

**B. Delivery:**

1. **Cesarean section**-has become the delivery method of choice with placenta previa. Perinatal mortality rates are lower with cesarean delivery for every type of placenta previa (even lesser degrees).



**B. Delivery:**

2. **Vaginal delivery**, is usually reserved for patients with a low-lying implantation and a cephalic presentation or a greater degree of placenta previa when there is little or no prospect of salvaging the fetus. If vaginal delivery is elected, the membranes should be artificially ruptured prior to any attempt to stimulate labor (oxytocin given before amniotomy is likely to cause further bleeding). Tamponade of the presenting part against the placental edge usually reduces bleeding as labor progresses.

## 57. Abruptio placae: etiology, pathogenesis, clinical features, diagnosis,

management of pregnancy and labor.

**PREMATURE SEPARATION OF THE PLACENTA**  
(*Abruptio Placentae, Ablatio Placentae, Accidental Hemorrhage*)

**Essentials of Diagnosis**

- Unintended abdominal (uterine) or back pain.
- Irritable, tender, and often hypertonic uterus.
- Visible or concealed hemorrhage.
- Evidence of fetal distress may or may not be present depending on the severity of the process.

**General Considerations**

Premature separation of the placenta is defined as separation from the site of uterine implantation before delivery of the fetus (about 1 in 77-89 deliveries). The severe form (resulting in fetal death) has an incidence of about 1 in 500-750 deliveries.

**PREMATURE SEPARATION OF THE PLACENTA**

Approximately 30% of cases of third-trimester bleeding are due to placental separation, with the initial hemorrhage usually encountered after the 25th week. Placental separation in early pregnancy cannot be distinguished from other causes of abortion. About 50% of separations occur before the onset of labor, and 10-15% are not diagnosed before the second stage of labor.

## PREMATURE SEPARATION OF THE PLACENTA

**Etiology**

The hypertensive states of pregnancy are associated with 2.5-17.9% incidence of placental separation. However, in abruptio placentae extensive enough to cause fetal death, about 50% of cases are associated with hypertensive states of pregnancy.

Approximately half of these cases are chronic hypertension and half pregnancy-induced hypertension.

**Other predisposing factors include:**

- advanced maternal age
- multiparity
- uterine distortion (eg. multiple pregnancy, hydranios)
- vascular deficiency or deterioration (eg. diabetes mellitus, collagen diseases complicating pregnancy)
- uterine anomalies or tumors (eg. leiomyoma)
- cigarette smoking
- alcohol consumption (> 14 drinks per week)
- possibly maternal type O blood.

## PREMATURE SEPARATION OF THE PLACENTA

**Clinical Findings**

**A. Symptoms and Signs:** In general, the clinical findings correspond to the degree of separation. About 30% of separations are small, produce few or no symptoms, and usually are not noted until the placenta is inspected. Larger separations are accompanied by abdominal pain and uterine irritability. Hemorrhage may be visible or concealed. If the process is extensive, there may be evidence of fetal distress, uterine tetany, disseminated intravascular coagulation, or hypovolemic shock.

Increased uterine tonus and frequency of contractions reflected by fetal heart rate monitoring may provide early clues of abruption.

**B. Laboratory Findings:**

- ✓ The degree of anemia will probably be considerably less than the amount of blood loss would seem to justify, bc. cause changes in hemoglobin and hematocrit are delayed during acute blood loss until secondary hemodilution has occurred.
- ✓ More sophisticated studies should be available on an emergency basis in most hospitals. The following will assist in determination of coagulation status: prothrombin time, and partial thromboplastin time, platelet count, fibrinogen, and fibrin split products.
- ✓ Ultrasoundography may be useful but is not totally reliable, because it may not reveal the retroplacental clot in most cases.

## PREMATURE SEPARATION OF THE PLACENTA

**Treatment**

**A. Emergency Measures:** as the first step toward delivery and in an effort to minimize the possibility of disseminated intravascular coagulation or amniotic fluid embolus, the membranes should be artificially ruptured to release as much amniotic fluid as possible. Internal monitoring will provide useful information about uterine tonus and contractions as well as the status of the fetus.

At the same time, blood should be drawn for laboratory studies and at least 4 units of blood made ready for possible transfusion. A solution of lactated Ringer's injection should be administered, and additional antishock measures should be instituted as necessary.

**B. Expectant Therapy:** expectant therapy is appropriate when the fetus is immature, bleeding is not extensive, uterine irritability is absent or minimal, and there is no fetal distress. The presumptive diagnosis, if placenta previa can be ruled out is probably a small marginal placental separation.

The patient should be hospitalized, typed and crossmatched, and observed for a period of 24-48 hours until one is certain that further placental separation is not occurring, premature labor not likely, and placenta previa is not present.

**C. Vaginal Delivery:** An attempt at vaginal delivery is indicated if the degree of separation appears to be limited and if the fetus can be monitored for signs of fetal distress. When placental separation is extensive but the fetus is dead or of dubious viability, vaginal delivery is also indicated unless hemorrhage is rapid and uncontrollable.

**D. Cesarean Section:** is also indicated if conditions are not favorable for rapid delivery in the face of progressive or severe placental separation, if the fetus is in good condition.

### 59. Hemorrhages in the early postpartum period: etiology, clinical features, diagnosis, treatment and prevention.

#### Early postpartum haemorrhage

Possible causes

Uterine atony

Obstetric trauma

Retained placenta

Coagulation disorders

**Management during the first 30 minutes**

**Cause-specific management**

Uterine atony

Obstetric trauma

Retained placenta

Coagulation disorders

**Management of persistent haemorrhage**

Early postpartum haemorrhage is defined as bleeding that occurs within 24 hours (usually immediately) after delivery of the placenta. The volume exceeds the normal 500 ml third stage blood loss.

Delay in treatment can lead to coagulation disorders, with a risk of massive, diffuse bleeding. Close delivery room monitoring is crucial for two hours postpartum, in order to rapidly identify and treat haemorrhage.

**Management during the first 30 minutes**

**Treatment is always the same, and performed immediately to avoid massive haemorrhage:**

- Ask for help.
- Evaluate the heart rate, blood pressure, level of consciousness, oxygen saturation (if available), and blood loss (blood loss is easily underestimated, up to 50%), then monitor regularly.
- Insert two IV lines (catheter 16-18G), rapid fluid resuscitation with Ringer lactate or 0.9% sodium chloride (1 litre over 15 minutes).
- In anticipation of a blood transfusion, determine the patient's blood type and select potential donors or make sure that blood is available. If transfusion is performed, the blood must have been tested (HIV-1, HIV-2, hepatitis B, hepatitis C and syphilis).
- Measure haemoglobin (HemoCue).
- High-flow oxygen therapy.
- If systolic blood pressure is < 90 mmHg, elevate the legs (keep, or replace, the patient's feet in the delivery table stirrups).
- Perform uterine massage to expel any clots and aid uterine contraction. In case of massive haemorrhage, maintain bimanual compression until uterotronics take effect.
- Make sure the uterus is empty: immediately remove the placenta manually if it has not yet delivered and/or manually explore the uterus.
- Administer routinely a uterotonic to correct uterine atony or ensure uterine retraction:

oxytocin: 5 to 10 IU by slow IV injection, and at the same time, start an IV infusion with 20 IU of oxytocin in 1 litre of Ringer lactate or 0.9% sodium chloride, to be administered over 2 hours (160 drops/minute).

- Insert a Foley catheter: keeping bladder empty facilitates uterine retraction.
- Inspect systematically the birth canal: check for injury to the cervix or vagina using retractors.
- Record in a chart: results of the initial evaluation, monitoring and actions, indicating the times.

#### **Management of persistent haemorrhage**

- Maintain adequate haemodynamics: Ringer lactate up to 2 litres, then a plasma substitute and blood. The goals are systolic blood pressure  $\geq$  100 mmHg, oxygen saturation  $\geq$  95%, urine output  $\geq$  30 ml/hour, and normal level of consciousness.
- Insert a Bakri intrauterine balloon (Appendix 2). If the patient is still in a BEmONC facility, it is imperative to transfer her to a CEmONC facility once the balloon is inserted.
- Transfuse if blood loss is heavy ( $>$  1500 ml), to achieve or maintain a haemoglobin level of at least 7 g/dl and/or if there are coagulation disorders. Blood or blood products must have been screened before transfusion (HIV-1, HIV-2, hepatitis B, hepatitis C and syphilis).

In the event of moderate haemorrhage with no coagulation disorder, transfuse packed red blood cells or whole blood.

In the event of massive haemorrhage and/or coagulation disorders, transfuse fresh whole blood or packed red blood cells or whole blood + fresh frozen plasma.

– Make sure that all procedures (manual placenta removal, uterine exploration, birth canal inspection, oxytocics, and urinary catheterisation) have indeed been performed.

– Additional measures:

- at a minimum, massage the uterus every 15 minutes for 2 hours,

plus, if needed, one of the following procedures:

- apply pressure to the abdominal aorta (just above the umbilicus) until the femoral pulse is no longer palpable, for example, the time it takes to insert a Bakri balloon or start laparotomy
- compress the uterus with both hands through the abdominal wall, if it is still large and atonic;
- compress the uterus between fingers in the vagina and a hand on the abdomen
- compress the uterus between the fist and a hand on the abdomen

**58. Postpartum hemorrhages: etiology, clinical features, diagnostic methods, treatment and prevention.**

### 3. Postpartum Hemorrhage and the Abnormal Puerperium

**Postpartum Hemorrhage**

**Definition**

Postpartum haemorrhage (PPH) is a major cause of maternal mortality worldwide with an overall prevalence of approximately 6%. Postpartum hemorrhage denotes excessive bleeding (> 500 mL in vaginal delivery) following delivery.

Hemorrhage may occur before, during, or after delivery of the placenta. Actual measured blood loss during uncomplicated vaginal deliveries has been shown to average 700 mL, and blood loss may often be underestimated.

Nevertheless, the criterion of a loss of 500 mL is acceptable on historical grounds and because one unit of blood also contains 500 mL. The parallel has obvious value in estimating the need for transfusion.

Blood lost during the first 24 hours after delivery is early postpartum hemorrhage; that lost between 24 hours and 6 weeks after delivery is late postpartum hemorrhage.

### Postpartum Hemorrhage

**Causes and Risk Factors for PPH**

Table summarises the risk factors for PPH. However, in most cases of PPH no identifiable risk factor(s) is present. The management of PPH would have been easier if there were one and only one major cause. Unfortunately, this is not the case. Uterine atony accounts for the vast majority PPH, but other factors.

### Risk factors for Postpartum Hemorrhage

<b>Risk factors which are present pre-conception</b>	Age > 40, not multiparous Asian ethnicity BMI>35 kg/m <sup>2</sup>
<b>Risk factors developing during pregnancy</b>	Anaemia (<9g/dl) Known placenta previa Suspected or proven placental abruption Multiple pregnancy Pre-eclampsia or gestational hypertension Induction of labour
<b>Risk factors at delivery</b>	Caesarean Section (elective or emergency) Operative vaginal delivery Prolonged labour (>12 hours) Birth weight of baby >4kg Medio-lateral episiotomy Retained placenta Pyrexia in labour (пижорадка)

### Postpartum Hemorrhage

**Etiology**

Causes of postpartum hemorrhage include uterine atony, obstetric lacerations, retained placental tissue, and coagulation defects.

A. **Uterine Atony.**

B. **Obstetric Lacerations:** Excessive bleeding from an episiotomy, lacerations, or both cause about 20% of cases of postpartum hemorrhage. Lacerations can involve the uterus, cervix, vagina, or vulva, and they usually result from precipitate or uncontrolled delivery or operative delivery of a large infant, but they may occur after any delivery.

C. **Retained Placental Tissue** (задержка частей плаценты и оболочек): Retained placental tissue and membranes cause 5–10% of cases of postpartum hemorrhage. Retention of placental tissue in the uterine cavity occurs in placenta accreta, in manual removal of the placenta, in mismanagement of the third stage of labor, and in unrecognized succenturiate placentas.

### Postpartum Hemorrhage

**Etiology**

D. **Coagulation Defects:** Coagulopathies in pregnancy may be acquired coagulation defects seen in association with several obstetric disorders, including abruptio placentae, excess thromboplastin from a retained dead fetus, amniotic fluid embolism, severe preeclampsia, eclampsia, and sepsis. These coagulopathies may present as hypofibrinogenemia, thrombocytopenia, and disseminated intravascular coagulation. Transfusion of more than 8 units of blood may in itself induce coagulopathy.

Von Willebrand's disease, autoimmune thrombocytopenia, or leukemia may also occur in pregnant women.

**Prevention**

Recommends that the oxytocics be offered routinely in the management of the third stage of labour in all women, as their administration reduces the risk of Postpartum Hemorrhage by about 60%.

### Management

Syntometrine (\*Alliance) may be used in the absence of hypertension (antenatal low haemoglobin) as it reduces the risk of minor PPH (500-1000 ml) but increases vomiting.

**Misoprostol** is not as effective as oxytocin but it may be used when the latter is not available, such as the home-birth setting. All women who have had a previous caesarean section must have their placental site determined by **ultrasound**. Where facilities exist, **magnetic resonance imaging (MRI)** may be a useful tool and assist in determining whether the placenta is accreta or percreta.

Women with placenta accreta/percreta are at very high risk of major PPH. If placenta accreta or percreta is diagnosed antenatally, consultant-led multidisciplinary planning for delivery facilitates the process, reduces the likelihood of unexpected poor outcomes and most likely improves outcomes.

Management of Postpartum Hemorrhage (PPH)	
Summary of the management of major PPH	
Call for help	<ul style="list-style-type: none"> <li>Senior midwife/obstetrician and anaesthetist; to alert haematologist, blood transfusion laboratory and consultant obstetrician</li> </ul>
Resuscitation	<ul style="list-style-type: none"> <li>Oxygen mask (1.5 litres)</li> <li>Fluid balance (2 litres Hartmann's, 1.5 litres colloid)</li> <li>Blood transfusion (O RHD negative or group-specific blood)</li> <li>Blood products (FFP, PLT, cryoprecipitate, factor VII a)</li> <li>Keep patient warm</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>Uterine stimulants x 2</li> <li>Coagulation</li> <li>Cross match (FFP, PLT, cryoprecipitate)</li> <li>Oximeter</li> <li>Foley catheter</li> <li>Hb bedside testing</li> <li>Blood products</li> <li>Consider central and arterial lines</li> <li>Weigh all swabs and estimate blood loss</li> </ul>
Medical treatment	<ul style="list-style-type: none"> <li>Bimanual uterine compression</li> <li>Empty bladder</li> <li>Oxytocin 5 IU x 2</li> <li>Ergometrine 500 µg</li> <li>Oxytocin infusion (40 U in 500 ml)</li> <li>Carboprost 250 µg IM every 15 minutes up to 8 times</li> <li>Carboprost (Intramayometrial) 0.5 mg</li> <li>Misoprostol 1000 µg rectally</li> </ul>
Mechanical methods	<ul style="list-style-type: none"> <li>Intrauterine balloon tamponade</li> <li>Consider interventional radiology (Uterine artery embolisation)</li> </ul>
Surgery	<ul style="list-style-type: none"> <li>Brace suture</li> <li>Bilateral uterine artery ligation</li> <li>Bilateral internal iliac ligation</li> <li>Hysterectomy</li> </ul>
Post-operative care	<ul style="list-style-type: none"> <li>High-dependency unit/ Intensive care unit</li> </ul>

#### 60. Haemorrhagic shock: clinical features, stages, treatment, prevention, rehabilitation.

#### 61. Nausea and vomiting in pregnancy: etiology and pathogenesis, classification, diagnostic techniques, clinical feature, treatment.

##### How common is nausea and vomiting of pregnancy?

Nausea and vomiting of pregnancy is a very common condition. Although nausea and vomiting of pregnancy often is called "morning sickness," it can occur at any time of the day. Nausea and vomiting of pregnancy usually is not harmful to the fetus, but it can have a serious effect on your life, including your ability to work or do your normal daily activities.

##### When does nausea and vomiting of pregnancy start?

Nausea and vomiting of pregnancy usually starts before 9 weeks of pregnancy. For most women, it goes away by the second trimester (14 weeks of pregnancy). For some women, it lasts for several weeks or months. For a few women, it lasts throughout the entire pregnancy.

What is the difference between mild and severe nausea and vomiting of pregnancy?

Some women feel nauseated for a short time each day and may vomit once or twice. This usually is defined as mild nausea and vomiting of pregnancy. In more severe cases, nausea lasts several hours each day and vomiting occurs more frequently. Deciding to seek treatment depends on how much nausea and vomiting of pregnancy affects your life and causes you concern, not whether your condition is "mild" or "severe."

##### What is hyperemesis gravidarum?

Hyperemesis gravidarum is the most severe form of nausea and vomiting of pregnancy. It occurs in up to 3% of pregnancies. This condition may be diagnosed when a woman has lost 5% of her prepregnancy weight and has other problems related to dehydration (loss of body fluids). Women with hyperemesis gravidarum need treatment to stop their vomiting and restore body fluids. Sometimes treatment in a hospital is needed.

##### Am I at risk of severe nausea and vomiting of pregnancy?

**If you have any of the following factors, your risk of severe nausea and vomiting of pregnancy may be increased:**

Being pregnant with more than one fetus (multiple pregnancy)  
Past pregnancy with nausea and vomiting (either mild or severe)  
Your mother or sister had severe nausea and vomiting of pregnancy  
History of motion sickness or migraines  
Being pregnant with a female fetus

**Could nausea and vomiting during pregnancy be caused by another medical condition?**

Some medical conditions can cause nausea and vomiting during pregnancy. These include an ulcer, food-related illness, thyroid disease, or gallbladder disease. Your obstetrician or other health care professional may suspect that you have one of these conditions if you have signs or symptoms that do not usually occur with nausea and vomiting of pregnancy:

Nausea and vomiting that occurs for the first time after 9 weeks of pregnancy

Abdominal pain or tenderness

Fever

Headache

Enlarged thyroid gland (swelling in the front of the neck)

Can nausea and vomiting of pregnancy affect my fetus?

Having nausea and vomiting of pregnancy usually does not harm your health or your fetus's health. It does not mean your fetus is sick. It can become more of a problem if you cannot keep down any food or fluids and begin to lose weight. When this happens, it sometimes can affect the fetus's weight at birth. You also can develop problems with your thyroid, liver, and fluid balance.

**When is the best time to treat nausea and vomiting of pregnancy?**

Because severe nausea and vomiting of pregnancy is hard to treat and can cause health problems, many experts recommend early treatment so that it does not become severe.

**What can I do to feel better if I have nausea and vomiting of pregnancy?**

**Diet and lifestyle changes may help you feel better. You may need to try more than one of these suggestions:**

Take a multivitamin.

Try eating dry toast or crackers in the morning before you get out of bed to avoid moving around on an empty stomach.

Drink fluids often.

Avoid smells that bother you.

Eat small, frequent meals instead of three large meals.

Try bland foods. For example, the “BRATT” diet (bananas, rice, applesauce, toast, and tea) is low in fat and easy to digest.

Try ginger ale made with real ginger, ginger tea made from fresh grated ginger, ginger capsules, and ginger candies.

If you do vomit a lot, it can cause some of your tooth enamel to wear away. This happens because your stomach contains a lot of acid. Rinsing your mouth with a teaspoon of baking soda dissolved in a cup of water may help neutralize the acid and protect your teeth.

**Is there medical treatment for nausea and vomiting of pregnancy?**

If diet and lifestyle changes do not help your symptoms, or if you have severe nausea and vomiting of pregnancy, medical treatment may be needed. If other medical conditions are ruled out, certain **medications can be given to treat nausea and vomiting of pregnancy:**

Vitamin B6 and doxylamine—Vitamin B6 is a safe, over-the-counter treatment that may be tried first. Doxylamine, a medication found in over-the-counter sleep aids, may be added if vitamin B6 alone does not relieve symptoms. A prescription drug that combines vitamin B6 and doxylamine is available. Both drugs—taken alone or together—have been found to be safe to take during pregnancy and have no harmful effects on the fetus.

“Antiemetic” drugs—if vitamin B6 and doxylamine do not work, “antiemetic” drugs may be prescribed. These drugs prevent vomiting. Many antiemetic drugs have been shown to be safe to use during pregnancy. Others have conflicting or limited safety information. You and your obstetrician or other members of your health care team can discuss all of these factors to determine the best treatment for your personal situation.

**What may happen if my nausea and vomiting are severe or I have hyperemesis gravidarum?**

You may need to stay in the hospital until your symptoms are under control. Lab tests may be done to check how your liver is working. If you are dehydrated from loss of fluids, you may receive fluids and vitamins through an intravenous line. If your vomiting cannot be controlled, you may need additional medication. If you continue to lose weight, sometimes tube feeding is recommended to ensure that you and your fetus are getting enough nutrients.

**62. Pre-eclampsia: pathogenesis, classification, severity, diagnostic methods.**

Preeclampsia is a complication of pregnancy, due to the mismatch of the possibilities of adaptive systems of the mother adequately to meet the needs of the developing fetus, characterized by more or less typical infringements of activity of cardiovascular, nervous systems, changes of the kidneys, liver, placenta, metabolism. Thus, developing the syndrome of multiple organ failure.

In the structure of causes of maternal mortality in the Republic of Belarus gestosis take the second place (from 11% to 23%) after obstetric bleedings.

The risk group for the development of gestosis:

1. Young and ageing pregnant women
2. The presence of extragenital pathology: diabetes, liver disease and kidney disease
3. Multiple births, polyhydramnios, large fetus
4. Anaemia in pregnant women, arterial hypotension

5. RH conflict pregnancies

7. Stress, fatigue

8. Wrong, unbalanced nutrition

9. Harmful professional and domestic factors, Smoking

10. Gestosis in history

11. Transferred inflammation of genitals, fibroids, abortion

12. Genetic predisposition

Classification of gestosis:

Time of occurrence

The early gestosis - occur in the first half of pregnancy (usually up to 12 to 16 weeks of pregnancy)

The late gestosis - occur in the second half of pregnancy (usually after 20 weeks of pregnancy)

Early gestosis:

The common form:

the vomiting of pregnancy (mild, moderate and severe)

the salivation

The rare forms:

the medicine pregnant (itching, eczema)

the jaundice of pregnancy

the bronchial asthma pregnant

the tetany pregnant

the osteomalacia

Late gestosis:

1. Monocompany:

The hypertension of pregnant

The pregnant swelling (edema)

The proteinuria pregnant

Pre-eclampsia

Eclampsia

The typical triad of symptoms of Zangemeister (edema, proteinuria, hypertension)

The atypical - HELLP syndrome, acute fatty liver, cholestatic steatosis of pregnant women

Pre-eclampsia (praeclampsia)

Complication of pregnancy in which the clinical picture of late gestosis join the symptoms indicative of violation of the functions of the Central and autonomic nervous system in the result of violations of cerebral circulation.

This leads to brain swelling and increased intracranial pressure.

Clinical symptoms of pre-eclampsia

the headache with localization in the frontal or occipital region

the dizziness

the nasal congestion

the coughing, hoarseness

the visual disturbances

the pain in epigastral area

the General restlessness, anxiety, euphoria, insomnia or confusion, lethargy, drowsiness

#### **63. Modern principles of the treatment of pre-eclampsia depending on their severity.**

Labor management is complicated by pre eclampsia, General principles:

Continuous monitoring of the mother and fetus.

Holding intensive care during childbirth:

- antihypertensive therapy under the supervision of BP;
- antispasmodics, antihypoxants, means improving maternal-placental blood flow.

Phased prolonged analgesia, including epidural anesthesia in the first and second periods of confinement.

all the manipulations on the background of adequate anesthesia.

Oxygen therapy.

#### **64. Eclampsia. Clinical features. Diagnosis, first aid and treatment.**

Eclampsia (eclampsia)

This is the final and most serious stage of gestosis with the occurrence of convulsions and loss of consciousness.

Eclampsia can be defined as clinically expressed syndrome of multiple organ failure.

Each attack consists of 4 periods:

predatorily

the tonic convulsions

the clonic convulsions

the resolution seizure

#### What causes eclampsia?

Eclampsia often follows preeclampsia, which is characterized by high blood pressure occurring in pregnancy and, rarely, postpartum. Other findings may also be present such as protein in the urine. If your preeclampsia worsens and affects your brain, causing seizures, you have developed eclampsia.

Doctors don't know for sure what causes preeclampsia, but it's thought to result from abnormal formation and function of the placenta. They can explain how the symptoms of preeclampsia may lead to eclampsia.

High blood pressure

Proteinuria

#### How is eclampsia diagnosed?

If you already have a preeclampsia diagnosis or have a history of it, your doctor will order tests to determine if your preeclampsia has happened again or gotten worse. If you don't have preeclampsia, your doctor will order tests for preeclampsia as well as others to determine why you're having seizures. These tests can include:

Blood tests

Your doctor may order several types of blood tests to assess your condition. These tests include a complete blood count, which measures how many red blood cells you have in your blood, and a platelet count to see how well your blood is clotting. Blood tests will also help examine your kidney and liver function.

Creatinine test

Creatinine is a waste product created by the muscles. Your kidneys should filter most of the creatinine from your blood, but if the glomeruli get damaged, excess creatinine will remain in the blood. Having too much creatinine in your blood may indicate preeclampsia, but it doesn't always.

Urine tests

Your doctor may order urine tests to check for the presence of protein and its excretion rate.

#### What are the treatments for eclampsia?

Delivering your baby and placenta are the recommended treatment for preeclampsia and eclampsia. Your doctor will consider the severity of the disease and how mature your baby is when recommending timing of delivery.

If your doctor diagnoses you with mild preeclampsia, they may monitor your condition and treat you with medication to prevent it from turning into eclampsia. Medications and monitoring will help keep your blood pressure within a safer range until the baby is mature enough to deliver.

If you do develop severe preeclampsia or eclampsia, your doctor may deliver your baby early. Your care plan will depend on how far along you are in your pregnancy and the severity of your disease. You will need to be hospitalized for monitoring until you deliver your baby.

#### Medications

Medications to prevent seizures, called anticonvulsants drugs, may be necessary. You may need medication to lower blood pressure if you have high blood pressure. You may also receive steroids, which can help your baby's lungs mature prior to delivery.

### **65. Abnormal uterine action: etiology, pathogenesis, classification, diagnostic methods.**

Abnormal Uterine Action

#### Classification

-Over-efficient uterine action

Precipitate labour: in absence of obstruction

Excessive contraction and retraction: in presence of obstruction

-Inefficient uterine action

Hypotonic inertia

Hypertonic inertia

-Colicky uterus

-Hyperactive lower uterine segment

Constriction (contraction) ring

-Cervical dystocia

#### **PRECIPITATE LABOUR**

Definition

A labour lasting less than 3 hours.

Aetiology

It is more common in multiparas when there are;

strong uterine contractions,

small sized baby,

roomy pelvis,

minimal soft tissue resistance.

#### Complications

##### Maternal:

Lacerations of the cervix, vagina and perineum.

Shock.

Inversion of the uterus.

##### Postpartum haemorrhage:

no time for retraction,

lacerations.

##### Sepsis due to:

lacerations,

inappropriate surroundings.

##### Foetal:

Intracranial haemorrhage due to sudden compression and decompression of the head.

##### Foetal asphyxia due to:

strong frequent uterine contractions reducing placental perfusion,

lack of immediate resuscitation.

Avulsion of the umbilical cord.

Foetal injury due to falling down.

#### Management

##### Before delivery

Patient who had previous precipitate labour should be hospitalized before expected date of delivery as she is more prone to repeated precipitate labour.

##### During delivery

Inhalation anaesthesia: as nitrous oxide and oxygen is given to slow the course of labour.

Tocolytic agents: as ritodrine (Yutopar) may be effective.

Episiotomy: to avoid perineal lacerations and intracranial haemorrhage.

## After delivery

Examine the mother and foetus for injuries.

### **EXCESSIVE UTERINE CONTRACTION AND RETRACTION**

#### **Physiological Retraction Ring**

It is a line of demarcation between the upper and lower uterine segment present during normal labour and cannot usually be felt abdominally.

#### **Pathological Retraction Ring (Bandl's ring)**

It is the rising up retraction ring during obstructed labour due to marked retraction and thickening of the upper uterine segment while the relatively passive lower segment is markedly stretched and thinned to accommodate the foetus.

The Bandl's ring is seen and felt abdominally as a transverse groove that may rise to or above the umbilicus.

Clinical picture: is that of obstructed labour with impending rupture uterus (see later).

Obstructed labour should be properly treated otherwise the thinned lower uterine segment will rupture.

### **HYPOTONIC UTERINE INERTIA**

#### **Definition**

The uterine contractions are infrequent, weak and of short duration.

#### **Aetiology**

Unknown but the following factors may be incriminated:

#### **General factors:**

Primigravida particularly elderly.

Anaemia and asthenia.

Nervous and emotional as anxiety and fear.

Hormonal due to deficient prostaglandins or oxytocin as in induced labour.

Improper use of analgesics.

#### **Local factors:**

Overdistension of the uterus.

Developmental anomalies of the uterus e.g. hypoplasia.

Myomas of the uterus interfering mechanically with contractions.

Malpresentations, malpositions and cephalopelvic disproportion. The presenting part is not fitting in the lower uterine segment leading to absence of reflex uterine contractions.

Full bladder and rectum.

## Types

Primary inertia: weak uterine contractions from the start.

Secondary inertia: inertia developed after a period of good uterine contractions when it failed to overcome an obstruction so the uterus is exhausted.

## Clinical Picture

Labour is prolonged.

Uterine contractions are infrequent, weak and of short duration.

Slow cervical dilatation.

Membranes are usually intact.

The foetus and mother are usually not affected apart from maternal anxiety due to prolonged labour.

More susceptibility for retained placenta and postpartum haemorrhage due to persistent inertia.

Tocography: shows infrequent waves of contractions with low amplitude.

## Management

General measures:

Examination to detect disproportion, malpresentation or malposition and manage according to the case.

Proper management of the first stage (see normal labour).

Prophylactic antibiotics in prolonged labour particularly if the membranes are ruptured.

Amniotomy:

Providing that;

vaginal delivery is amenable,

the cervix is more than 3 cm dilatation and

the presenting part occupying well the lower uterine segment.

Artificial rupture of membranes augments the uterine contractions by:

release of prostaglandins.

reflex stimulation of uterine contractions when the presenting part is brought closer to the lower uterine segment.

Oxytocin:

Providing that there is no contraindication for it, 5 units of oxytocin (syntocinon) in 500 c.c glucose 5% is given by IV infusion starting with 10 drops per minute and increasing gradually to get a uterine contraction rate of 3 per 10 minutes.

**Operative delivery:**

Vaginal delivery: by forceps, vacuum or breech extraction according to the presenting part and its level providing that,

cervix is fully dilated.

vaginal delivery is amenable.

Caesarean section is indicated in:

failure of the previous methods.

contraindications to oxytocin infusion including disproportion.

foetal distress before full cervical dilatation.

#### **HYPERTONIC UTERINE INERTIA (Uncoordinated Uterine Action)**

**Types:**

Colicky uterus: incoordination of the different parts of the uterus in contractions.

Hyperactive lower uterine segment: so the dominance of the upper segment is lost.

**Clinical Picture**

The condition is more common in primigravidae and characterised by:

Labour is prolonged.

Uterine contractions are irregular and more painful. The pain is felt before and throughout the contractions with marked low backache often in occipito-posterior position.

High resting intrauterine pressure in between uterine contractions detected by tocography (normal value is 5-10 mmHg).

Slow cervical dilatation .

Premature rupture of membranes.

Foetal and maternal distress.

**Management**

General measures: as hypotonic inertia.

Medical measures:

Analgesic and antispasmodic as pethidine.

Epidural analgesia may be of good benefit.

Caesarean section is indicated in:

Failure of the previous methods.

Disproportion.

Foetal distress before full cervical dilatation.

## **CONSTRICION (CONTRACTION) RING**

### **Definition**

It is a persistent localised annular spasm of the circular uterine muscles.

It occurs at any part of the uterus but usually at junction of the upper and lower uterine segments.

It can occur at the 1st, 2nd or 3rd stage of labour.

### **Aetiology**

Unknown but the predisposing factors are:

Malpresentations and malpositions.

Clumsy intrauterine manipulations under light anaesthesia.

Improper use of oxytocin e.g.

use of oxytocin in hypertonic inertia.

IM injection of oxytocin.

### **Diagnosis**

The condition is more common in primigravidae and frequently preceded by colicky uterus.

The exact diagnosis is achieved only by feeling the ring with a hand introduced into the uterine cavity.

### **Complications**

Prolonged 1st stage: if the ring occurs at the level of the internal os.

Prolonged 2nd stage: if the ring occurs around the foetal neck.

Retained placenta and postpartum haemorrhage: if the ring occurs in the 3rd stage (hour-glass contraction).

### **66. Prolonged latent and active phase of labor: clinical features, diagnosis, methods of correction, prevention. The labor management.**

Prolonged labor is the inability of a woman to proceed with childbirth upon going into labor.

Prolonged labor typically lasts over 20 hours for first time mothers, and over 14 hours for women that have already had children. Failure to progress can take place during two different phases; the latent phase and active phase of labor. The latent phase of labor can be emotionally tiring and cause fatigue, but it typically does not result in further issues. The active phase of labor, on the other hand, if prolonged, can result in long term complications.

Symptoms include:

Labor extends beyond 18 hours

Dehydration and exhaustion of the mother

Pain around the back, sides, and thighs of the mother as a result of extreme muscle pressure

Severe pain when labor begins  
Increased heart rate of the mother  
Swollen large intestine on either side of the uterus as a result of gas build up  
Uterus sensitivity  
Ketosis  
Distress of the fetus  
Uterine ruptures  
Complications  
Distress to the fetus as a result of decreasing Oxygen levels  
Internal bleeding of the fetus's head (intracranial hemorrhage)  
Higher chance of operative delivery  
Risks of long term injuries to the infant such as hypoxic-ischemic encephalopathy (HIE) or cerebral palsy  
Infection of the uterus  
Damage to the birth canal  
Postpartum infection  
Postpartum hemorrhage  
Prolonged latent labor  
The term describes labor that occurs very slowly. This does not necessarily mean that the mother or fetus's health is being compromised, but it is painful and is an important indication for doctors to pay attention to warning signs of prolonged labor.  
Prolonged active labor  
The phase of labor that extends into multiple hours (at least 14). The cervix usually dilates to over 14 cm before active labor occurs. When it first begins, it is encouraged that women stand up, walk around, and eat or drink. If failure to progress extends beyond this point, preventative measures need to be taken.

Causes  
Fetal malpresentations  
Uterine contractions  
Cervical stenosis  
Cephalopelvic disproportion

## Prevention

If the mother is being closely monitored and begins to show signs of prolonged labor, medical professionals can take preventative measures to better the chances of the women delivering her child within 24 hours. A precise initial diagnosis of prolonged labor based on signs and symptoms is extremely important in applying proper precautionary treatment.

Oxytocin infusions upon an initial amniotomy is typically used to move normal labor back on track.

The application of oxytocin is only effective if administered on the basis of fetal distress.

This treatment method only pertains to specific states of the fetus. If the baby is experiencing malpresentation, for example, the only safe and reliable method to proceed with childbirth is medical interference.

## Management

### Assisted vaginal delivery

There are two different methods of assisted vaginal delivery that medical professionals typically utilize to aid in delivery in order to avoid surgical methods of fetal extraction.

### Cesarian sections

Cesarian sections, also referred to as C-sections are usually quick solutions to the issue of failure to progress

### **67. Impossibility of descend, protracted descend, arrest of descend: clinical features, diagnosis, methods of correction, prevention. The labor management.**

Protracted labor is abnormally slow cervical dilation or fetal descent during active labor. Diagnosis is clinical. Treatment is with oxytocin, operative vaginal delivery, or cesarean delivery.

Active labor usually occurs after the cervix dilates to  $\geq 4$  cm. Normally, cervical dilation and descent of the head into the pelvis proceed at a rate of at least 1 cm/h and more quickly in multiparous women.

## Etiology

Protracted labor may result from fetopelvic disproportion (the fetus cannot fit through the maternal pelvis), which can occur because the maternal pelvis is abnormally small or because the fetus is abnormally large or abnormally positioned (fetal dystocia).

Another cause of protracted labor is uterine contractions that are too weak or infrequent (hypotonic uterine dysfunction) or, occasionally, too strong or close together (hypertonic uterine dysfunction).

## Diagnosis

Assessment of pelvic dimensions, fetal size and position, and uterine contractions

## Often response to treatment

Diagnosis of protracted labor is clinical.

The cause must be identified because it determines treatment.

Assessing fetal and pelvic dimensions and fetal position (see Physical Examination) can sometimes determine whether the cause is fetopelvic disproportion. For example, fetal weight > 5000 g (> 4500 g in diabetic women) suggests fetopelvic disproportion.

Uterine dysfunction is diagnosed by evaluating the strength and frequency of contractions via palpation of the uterus or use of an intrauterine pressure catheter.

Diagnosis is often based on response to treatment.

#### Treatment

##### Oxytocin

Sometimes operative delivery if the 2nd stage of labor is prolonged

Cesarean delivery for fetopelvic disproportion or intractable hypotonic dysfunction

If the 1st or 2nd stage of labor proceeds too slowly and fetal weight is < 5000 g (< 4500 g in diabetic women), labor can be augmented with oxytocin, which is the treatment for hypotonic dysfunction. If normal progress is restored, labor can then proceed. If not, fetopelvic disproportion or intractable hypotonic dysfunction may be present, and cesarean delivery may be required.

If the 2nd stage of labor is prolonged, forceps or vacuum extraction may be appropriate after evaluation of fetal size, presentation, and station (2 cm below the maternal ischial spines [+2] or lower) and evaluation of the maternal pelvis.

The 2nd stage of labor is considered prolonged in the following cases:

In nulliparous women: Lack of continuing progress for 4 h with a regional anesthetic or 3 h without a regional anesthetic

In multiparous women: Lack of continuing progress for 3 h with a regional anesthetic or 2 h without a regional anesthetic (1)

Hypertonic uterine dysfunction is difficult to treat, but repositioning, short-acting tocolytics (eg, terbutaline 0.25 mg IV once), discontinuation of oxytocin if it is being used, and analgesics may help.

In an "arrest of descent", the head of the fetus is in the same place in the birth canal during the first and second examinations, which your doctor performs one hour apart. This signifies that the baby hasn't moved farther down the birth canal within the last hour. Arrest of descent is a diagnosis made in the second stage, after the cervix is completely dilated.

To determine whether abnormal labor can be corrected to allow for vaginal delivery, your doctor may decide to promote labor by administering oxytocin (Pitocin). This is a type of medication that stimulates uterine contractions to enhance labor. Your doctor can give you oxytocin through a vein using a medication pump to initiate and maintain regular contractions of the uterus. These contractions help push your baby out of the uterus and help dilate your cervix. The dose necessary to cause sufficient contractions varies considerably from one woman to another.

68. Excessive uterine activity: clinical features, diagnosis, methods of correction, prevention. The labor management. Complications for the mother and fetus.

## Uterine Tachysystole

The terms tachysystole, hypertonus, and hyperstimulation can all be used to refer to excessive uterine activity (contractions) during labor and delivery. Exact definitions for these terms vary; some consider only the frequency of contractions, while others take into account intensity, duration, resting tone between contractions, and/or the impact on the fetus. For the sake of simplicity, we will use the term "uterine tachysystole" throughout this article in reference to any sort of excessive uterine activity during labor and delivery.

Tachysystole deprives a fetus of oxygen and occasionally leads to an emergency complication known as uterine rupture. Some of the most serious long-term outcomes for the baby include hypoxic-ischemic encephalopathy (HIE), cerebral palsy (CP), and seizure disorders.

### Risk Factors and Causes of Tachysystole

Uterine tachysystole occurs more frequently in women who have been given synthetic prostaglandins (such as Cytotec) or oxytocin (such as Pitocin). These are medications that doctors sometimes prescribe to induce or augment labor, although Cytotec has not been FDA-approved for this use, and Pitocin should only be given when medically necessary. The risk of tachysystole increases with higher doses of these drugs and is especially high when both drugs are administered together. Research has indicated that administering synthetic prostaglandins increases uterine sensitivity to oxytocin.

### Outcomes of Tachysystole

When the uterus contracts, the supply of oxygenated blood to the placenta, and ultimately the baby, is temporarily constricted. Babies can withstand a certain degree of diminished oxygenation during labor and delivery, but if contractions are too strong, last too long, or occur too frequently, or there is little or no rest in between, this can lead to a dangerous level of oxygen deprivation.

Tachysystole can also occasionally lead to uterine rupture; this is an emergency complication that can result in severe maternal blood loss, birth asphyxia, and fetal acidosis. Infants who have experienced excessive uterine activity and/or uterine rupture may develop conditions such as hypoxic-ischemic encephalopathy (HIE), cerebral palsy (CP), and seizure disorders.

### Management of Tachysystole

If there are signs of tachysystole or fetal distress (oxygen deprivation), clinicians should cease the administration of labor-enhancing drugs. Even if the infant's heart rate appears to be normal, doctors should still immediately lower the dosage or stop administration entirely when a woman shows signs of tachysystole. It is possible that the situation will become more severe very quickly.

### Treatments

for tachysystole and fetal oxygen deprivation include placing the mother in the left lateral position, giving her oxygen, and increasing her IV fluids. Sometimes, additional medications can be given for fetal resuscit

ation. In some cases – especially if there is uterine rupture – an emergency C-section is necessary in order to prevent permanent harm to the fetus.

When physicians use labor-enhancing drugs, they must carefully monitor the fetus for signs of distress and be prepared to promptly respond if tachysystole occurs.

## **69. Dystocia of labor: clinical features, diagnosis, methods of correction, prevention. The labor management. Complications for the mother and fetus.**

Abnormal labor, which is usually referred to as dysfunctional labor, includes dystocia, which means difficult labor that is slow and not progressing. Dysfunctional labor can be due to abnormalities in uterine contraction and/or lack of ability of the mother to forcibly expel the fetus, a large fetus and/or an unusual orientation of the fetus in the uterus, or abnormalities in the pelvis such that the passage is blocked or too small. The latter may also be due to a disproportionate size of the fetus in relation to the size of the pelvis. Labor that is too rapid, referred to as precipitate labor, usually results from low resistance through the birth canal. The focus of this report is on dystocia since little is known about precipitate labor, it is rare, and there is no effective treatment for it.

Dystocia in the second stage of labor is characterized by prolonged duration or arrested descent. This may be caused by fetal malposition, inadequate contractions, poor maternal efforts, or true cephalopelvic disproportion. Manual rotation of a fetus in the occipitoposterior position to the occipitoanterior position.

ABNORMAL LABOR, or dystocia (literally, "difficult labor or childbirth")

results when anatomic or functional abnormalities of the fetus, the maternal bony pelvis, the uterus and cervix, and/or a combination of these interfere with the normal course of labor and delivery. The diagnosis and management of dystocia is a major health care issue, because more than one fourth of all cesarean sections are performed for this indication. Because the goal of modern obstetrics is a safe, healthy delivery for both mother and fetus, minimizing the morbidity and mortality of the labor process continues to be a primary focus of clinical attention.

Functional dystocia has been associated with two different types of abnormal contraction patterns.

A hypertonic pattern (incoordinative) typically has an elevated resting pressure and contractions of increased frequency but decreased coordination. It is seen more often with fetal malpresentation and uterine overdistension.

A second type of abnormal contraction pattern, called hypotonic dysfunction, is more common and frequently responds to oxytocin. The contractions are synchronous but weak or infrequent. With primary dysfunction, it is hypothesized that contractions were never normally established; with secondary dysfunction, it is suggested that contractions were once adequate and became weaker as labor progressed, usually after 4 cm of dilation.

## **70. Narrow pelvis: etiology, classification, methods of diagnosing of pelvis**

**anomalies, prevention.**

## **71. The course and management of pregnancy in various forms of contracted (narrow) pelvis.**

## **72. Cephalopelvic disproportion: causes, diagnosis, the management of the labor. Prevention.**

Cephalopelvic disproportion (CPD) occurs when a baby's head or body is too large to fit through the mother's pelvis. It is believed that true CPD is rare, but many cases of "failure to progress" during labor are given a diagnosis of CPD. When an accurate diagnosis of CPD has been made, the safest type of delivery for mother and baby is a cesarean.

What causes cephalopelvic disproportion (CPD)?

Possible causes of cephalopelvic disproportion (CPD) include:

Large baby due to:

Hereditary factors

Diabetes

Postmaturity (still pregnant after due date has passed)

Multiparity (not the first pregnancy)

Abnormal fetal positions

Small pelvis

Abnormally shaped pelvis

How is cephalopelvic disproportion (CPD) diagnosed?

The diagnosis of cephalopelvic disproportion is often used when labor progress is not sufficient and medical therapy such as use of oxytocin is not successful or not attempted. CPD can rarely be diagnosed before labor begins if the baby is thought to be large or the mother's pelvis is known to be small.

During labor, the baby's head molds and the pelvis joints spread, creating more room for the baby to pass through the pelvis.

Ultrasound is used in estimating fetal size but not totally reliable for determining fetal weight. A physical examination that measures pelvic size can often be the most accurate method for diagnosing CPD. If a true diagnosis of CPD cannot be made, oxytocin is often administered to help labor progression. Alternatively, the fetal position is changed.

### 73. Ruptures of the cervix, vagina, perineum. Causes, diagnosis, treatment, prevention.

#### VAGINAL TEARS

Vaginal Tears can occur at any part of the vaginal wall, but are seen mostly at the junction between the lateral and posterior walls. These tears may be superficial with only minor lacerations of the vaginal mucosa. But, sometimes the tears may be deep enough to expose the inner muscles.

First degree and second degree perineal tears are similar to vaginal wall tears and treated the same way.

Vaginal tears that involve only the skin around the vagina typically heal within a few weeks. There may be stinging pain, especially when passing urine when the acidic urine passes over the raw surface but this will gradually decrease and fade as the tears heal.

Tears can also occur on the labia, both labia majora and labia minora. Tears to the minora are not very uncommon but tears to the majora occur only in excessive manipulation of the vulva during childbirth. Tears to the labia can be either superficial abrasions or actual tearing of the labia.

#### Treatment / Management of Vaginal Tears

The vagina should always be examined under proper light immediately after the delivery of the baby for any such tears. All tears should be repaired immediately.

The woman should sit on a soft cushion for a few days after childbirth to help in decreasing the pain.

A cold pack applied to the vulva for CERVICAL TEARS

Minor tears of the cervix are very common during delivery, especially in a woman who is delivering her first child and may not need to be repaired. But sometimes, major lacerations which can cause severe bleeding may also occur. In fact, cervical tears are the commonest form of traumatic post partum hemorrhage.

Tears can occur with a normal childbirth but are more common with instrumental deliveries like Forceps or Vacuum aspiration.

Cervical tears are commonest at the lateral angle, between the anterior and posterior lips of the cervix, especially at the three o'clock and the nine o'clock positions.

Vaginal bleeding after childbirth which occurs despite a well-contracted uterus and which does not appear to be arising from the vagina or perineum is an indication for examining the cervix. The cervix should be thoroughly examined with a speculum and vaginal wall retractor and under proper light for an accurate diagnosis.

#### Causes of Cervical Tears

Delivery through an undilated cervix whether spontaneously, or by forceps.

Precipitate labour.

Rigid cervix due to previous operations like the LEEP procedure, conisation, or cervical amputation.

Very vascular cervix as can occur in low level placenta previa.

#### Treatment / Management of Cervical Tears

The aim of treatment is to control bleeding as early as possible by repairing the tear. Minor lacerations without active bleeding does not require to be repaired - they heal spontaneously with no ill effects.

Major cervical lacerations or tears need to be repaired in the Operating theater under anesthesia, good light and proper exposure of the tear.

A perineal tear is a laceration of the skin and other soft tissue structures which, in women, separate the vagina from the anus. Perineal tears mainly occur in women as a result of vaginal childbirth, which strains the perineum. It is the most common form of obstetric injury.<sup>[1]</sup> Tears vary widely in severity. The majority are superficial and may require no treatment, but severe tears can cause significant bleeding, long-term pain or dysfunction. A perineal tear is distinct from an episiotomy, in which the perineum is intentionally incised to facilitate delivery. Episiotomy, a very rapid birth, or large fetal size can lead to more severe tears which may require surgical intervention.

Treatment is to either let the tear heal naturally or to surgically repair it. Third and fourth degree tears generally require surgical repair. A Cochrane review of comparing surgical treatment with natural healing of first and second degree tears found no to little difference between the two

treatment options. The review concluded that there was insufficient evidence to recommend either treatment option over the other for first and second degree tears.

A surgical incision on the perineum skin called an episiotomy was historically used routinely in order to reduce perineal tears. However, its routine use has declined as there is some evidence it increases the severity of tears when it is not indicated.

A Cochrane review found that routine use of episiotomy increased the incidence of severe perineal tears by 30%.

Several other techniques are used to reduce the risk of tearing, but with little evidence for efficacy. Antenatal digital perineal massage is often advocated, and may reduce the risk of trauma only in nulliparous women.

'Hands on' techniques employed by midwives, in which the foetal head is guided through the vagina at a controlled rate have been widely advocated, but their efficacy is unclear.

Waterbirth and labouring in water are popular for several reasons, and it has been suggested that by softening the perineum they might reduce the rate of tearing. However, this effect has never been clearly demonstrated.

#### **74. Uterine rupture: etiology and classification, complications for the mother and fetus, prevention.**

Causes of uterine rupture include:

- Uterine overdistention (multifetal pregnancy, polyhydramnios, fetal anomalies)
- External or internal fetal version
- Iatrogenic perforation
- Excessive use of uterotronics
- Failure to recognize labor dystocia with excessive uterine contractions against a lower uterine restriction ring

If women who have had a prior cesarean delivery wish to try vaginal delivery, prostaglandins should not be used because they increase risk of uterine rupture.

Symptoms and signs of uterine rupture include: fetal bradycardia, variable decelerations, evidence of hypovolemia, loss of fetal station (detected during cervical examination), and severe or constant abdominal pain.

- excessive vaginal bleeding,-sudden pain between contractions,-contractions that become slower or less intense,-abnormal abdominal pain or soreness,-recession of the baby's head into the birth canal
- bulging under the pubic bone,-sudden pain at the site of a previous uterine scar,-loss of uterine muscle tone,-rapid heart rate, low blood pressure, and shock in the mother,-abnormal heart rate in the baby,-failure of labor to progress naturally

If the fetus has been expelled from the uterus and is located within the peritoneal cavity, morbidity and mortality increase significantly.

## Can uterine rupture be prevented?

The only way to prevent uterine rupture is to have a cesarean delivery. It can't be fully prevented during vaginal birth.

A uterine rupture shouldn't stop you from choosing vaginal birth. However, it's important to discuss all of your options with your doctor so that you make the best decision for you and your baby. Make sure your doctor is familiar with your medical history, and is aware of any previous births by cesarean delivery or surgeries on your uterus.

**Essentials of Diagnosis**

- Increased suprapubic pain and tenderness with labor.
- Sudden cessation of uterine contractions with a "tearing" sensation.
- Vaginal bleeding (or bloody urine).
- Recession of the fetal presenting part
- Disappearance of fetal heart tones.

Complete ruptures usually occur during the course of labor. One notable exception is the scar of a classic cesarean section (or hysterotomy) that typically ruptures during the third trimester before term and before the onset of labor.

Other causes of rupture without labor are placenta percreta, invasive mole, choriocarcinoma, and cornual pregnancy.

**Treatment**

Hysterectomy is the preferred treatment for most cases of complete uterine rupture.

**ANATOMICAL CLASSIFICATION**

- Lower segment rupture
- Rupture of corpus/fundus (upper segment) of uterus

**TRADITIONAL CLASSIFICATION**

1. **Complete rupture**
  - All the layers of the uterus, including the peritoneum, are torn.
  - Uterine contents escape into the uterine cavity.
  - Usually results in fetal death.
2. **Incomplete Rupture**
  - Visceral peritoneum is intact.
  - Usually the fetus lies in the uterine cavity.

**ETIOLOGICAL CLASSIFICATION (CAUSES)**

	During pregnancy	During labor
<b>Scar rupture</b>	1. Classical caesarean (hysterotomy) scar	1. Classical caesarean (hysterotomy) scar
<b>Iatrogenic rupture</b>	1. Injudicious and unmonitored use of oxytocics on pregnant uterus - Example: (i) Disproportion between sizes of presenting part and maternal pelvis (malpresentation) (ii) Extra doses of uterotonic drugs	1. Internal podalic version and breech extraction especially in cases of obstructed labor 2. Destructive surgeries on fetus 3. Manual removal of placenta 4. Difficult and forced extraction especially if performed under general anaesthesia Abdominal blunt trauma 5. Injudicious and unmonitored oxytocin infusion for acceleration of labor

## Classification of Uterus Rupture

1. Classification by Pathogenesis	
Spontaneous	Voluntary
- Histochemical etiology of uterine rupture - occurs without any function of uterus - Example: (i) Anatomy anomaly (ii) Dystrophy diseases (connective tissue autoimmune disease, inflammatory disease of uterus)	- result of hyperfunction of uterus - Example: (i) Disproportion between sizes of presenting part and maternal pelvis (malpresentation) (ii) Extra doses of uterotonic drugs

## 75. Cesarean section: indications, contra-indications and conditions for operation.

#### Reasons for Increase in Number of Caesarian Sections:

- Decrease in birth rate;
- Increase in number of aged primipara;
- Improvement in prenatal diagnostics of fetus state (ultrasound and other)
- Caesarean section in history;
- Aspiration to extend indications for Caesarean section in the interests of fetus;
- Improved Caesarean section technique.

#### Absolute Indications for Caesarean Section:

1. Anatomically narrow pelvis of III and VI degree of narrowing.
2. Clinical disproportion between the mother's pelvis and the head of the fetus.
3. Placenta praevia totalis
4. Placenta praevia partialis with severe bleeding in unprepared maternal passages.
5. Premature detachment of normally situated placenta with severe bleeding in unprepared maternal passages.
6. Potential or real uterine rupture.
7. Tumors in small pelvis organs preventing childbirth.
8. Defective uterine scar after surgical interventions.

#### Absolute Indications for Caesarean Section:

9. Urinary and intestinal-genital fistulas in history.
10. Cervical ruptures of III degree, rough scars in cervix and vagina.
11. Preeclampsia
12. Pronounced varicose veins in area of vagina and vulva.
13. Extragential or cervix cancer.
14. Extragential diseases such as high myopia, detachment of retina, brain diseases, cardiovascular diseases showing signs of decompensation, diabetes, diseases of the nervous system and other

#### Relative Indications for Caesarean Section:

1. Anomalies in labor activity beyond the scope of conservative therapy.
2. Abnormal position of fetus.
3. Pelvic presentation of fetus.
4. Incorrect insertion and presentation of the head.
5. Umbilical cord praevia or prolapse .
6. Malformations in uterus and vagina.
7. Aged primipara (over 30 years).
8. Chronic fetoplacental insufficiency.
9. Late pregnancy.
10. Multiple pregnancy.
11. Long infertility in history.

#### Indications for Caesarean Section in Childbirth:

1. Clinically narrow pelvis.
2. Premature rupture of amniotic fluid and lack of effect from labor induction.
3. Anomalies in labor activity not amenable to medical therapy.
4. Acute hypoxia.
5. Detachment of regular or low located placenta.
6. Potential or real uterine rupture.
7. Umbilical cord praevia or prolapse .
8. Incorrect insertion and presentation of the head of the fetus.
9. Agony or sudden death of the pregnant woman while the fetus is alive

#### Indications Against Caesarean Section:

1. Intrauterine fetal death (with the exception of cases when operation is performed because woman's life in danger).
2. Congenital malformations of the fetus incompatible with life.
3. Deep prematurity.
4. Hypoxia, if there is no confidence in a live birth of viable child and there are no immediate indications on the part of mother.
5. All immunodeficiency states.
6. Duration of labor for more than 12 hours.
7. Frequent manual and instrumental vaginal manipulation.
8. Adverse epidemiological situation in obstetric hospital.
9. Acute and worsening chronic diseases in pregnant women.

#### Conditions for Performing Caesarean Section

- 1. Presence of living and viable fetus.
- 2. No signs of infection in pregnant woman.
- 3. Consent of mother for the operation, which is reflected in the history.
- 4. General surgical conditions:
  - surgeon capable of operation;
  - qualified anesthesiologist and neonatologist;
  - availability of equipment.

#### 75. Cesarean section: indications, contra-indications and conditions for operation.

1. Cesarean Section: the indications for cesarean section are both fetal and

maternal. Abdominal delivery should be selected whenever delivery is not imminent for a fetus with a reasonable chance of survival who exhibits persistent evidence of distress. Cesarean section is also indicated if conditions are not favorable for rapid delivery in the face of progressive or severe placental separation, if the fetus is in good condition. This includes most nulliparous patients with less than 3-4 cm of cervical dilatation.

Maternal indications for cesarean section are uncontrollable hemorrhage from a contracted uterus, a rapidly expanding uterus with concealed hemorrhage (with or without a live fetus) when delivery is not imminent, uterine apoplexy as manifested by hemorrhage with secondary relaxation of a previously spastic uterus, or refractory uterus with delivery necessary (20%).

#### Complications

1. Defibrillation Syndrome: the mother must be continuously monitored well into the postpartum period for evidence of a clotting deficiency. There may be depletion not only of fibrinogen but also of platelet and of factors II, V, VIII, and X. Treatment will depend not only on the demonstration of hematologic deficiencies but also on the amount of active bleeding and the anticipated route of delivery.

2. Fresh whole blood-Fresh whole blood, although often difficult to obtain, is superior for treating clotting deficiencies and replacing blood loss because all the necessary factors will be present.

3. Packed red blood cells - are satisfactory for immediately replacing blood loss, but they do not contain clotting factors.

4. Cryoprecipitate packs - contain all the necessary labile coagulation factors and are free of hepatitis B virus.

5. Platelets-During active bleeding, the transfusion of platelets is often the best practical means of counteracting a clotting deficiency. A platelet pack contains about 20% fewer platelets than 1 unit of fresh blood.

6. Fibrinogen - is rarely indicated. Do not administer fibrinogen solely on the basis of laboratory tests. In the absence of active bleeding, fibrinogen

deficiency may be corrected spontaneously in a matter of hours. To administer fibrinogen under these circumstances is both unnecessary and likely to make matters worse because the excess fibrinogen may be converted to fibrin emboli. The best source of fibrinogen other than fresh blood is a cryoprecipitated preparation. Concentrated plasma can also be used. Quadruple-strength plasma contains about 4.4 g of fibrinogen per unit. The initial dose of fibrinogen is 4-6 g, but as much as 20-24 g may be required depending on the response.

7. Heparin - the prophylactic administration of heparin to block conversion of prothrombin to thrombin (and thereby reduce the consumption of coagulation factors) has been successfully employed in the management of the defibrillation associated with fetal death ("dead fetus syndrome"). The value of heparin in the treatment of acute placental separation has never been established; its use cannot be recommended, because of the risks of operative and postoperative hemorrhage if cesarean section is required.

8. Fibrinolysis - such as aminocaproic acid (Amicar) should not be given. This drug will complicate the problem by interfering with the mechanism of fibrinolysis.

9. Preparation for surgery - must be completed quickly. If cesarean section is indicated, materials to control a clotting deficiency must be on hand before an operation is undertaken, and treatment with coagulants should be underway if a clotting deficiency is already present. Although control of a clotting deficiency before surgery is started is desirable, a rapid rate of blood loss may require earlier intervention. In rare instances, removal of an extensively damaged uterus has been necessary to control hemorrhage—or even the clotting deficiency.

10. Acute Cor Pulmonale: is always a possibility because of emboli in the pulmonary microcirculation as a result of either defibrillation or the escape of amniotic cellular debris into maternal veins. The most important aspect of the immediate treatment of this life threatening complication is the use of a volume respirator.

## 11. Renal Cortical and Tubular Necrosis:

The possibility of renal cortical or tubular necrosis must be considered if oliguria persists after an adequate blood volume has been restored. An attempt should be made to improve renal circulation and promote diuresis by increasing fluid volume

## 76. Cesarean section: technique, complications.

### Types of Caesarean Sections:

#### B. In technique:

- 1). Abdominal (through anterior abdominal wall). Abdominal Caesarean section to interrupt pregnancy is called small Cesarean section. It is performed in the period from 16 to 28 weeks of pregnancy
- 2). Vaginal (through the frontal vault of the vagina).

### Types of Caesarean sections:

#### C. In relation to the peritoneum:

- 1). Intraperitoneal (transperitoneal) - with opening of the abdominal cavity:
  - corporal (classical);
  - in the lower uterine segment performed by cross section;
- 2). Extraperitoneal
- 3). Cesarean section at lower segment of uterus with temporary isolation of abdominal cavity.

Complications of Caesarean section can occur in intraoperative and postoperative period:

- I. Intraoperative:
  - bleeding;
  - injury in adjacent organs;
  - difficulty in ejecting head;
  - difficulties in ejecting child;
  - complications caused by anesthesia.

Complications of caesarean section can occur in intraoperative and postoperative period:

- II. Postoperative:
  - internal and external bleeding;
  - deep vein thrombosis;
  - thromboembolism;
  - complications caused by anesthesia;
  - bruising in different places;
  - purulent and septic complications: endometritis, salpingitis, wound infection, obstetric peritonitis, sepsis;
  - bowel obstruction;
  - urinary and intestinal genital fistulas.

### Stages of Cesarean sections:

1. Laparotomy.
2. Incision of uterus.
3. Removal of fetus.
4. Closure of uterus.
5. Closure of anterior abdominal wall.

## 77. Forceps: indications, contra-indications, conditions for forceps. Technique. Complications.

### Obstetrical Forceps

Forceps (obstetrical forceps) are used to extract the living fetus by head in strict accordance with natural biomechanism of labor. Frequency of application of forceps in modern obstetrics is 1 %. Forceps are used to extract fetus. But they are not used for rotating or compression.

### Obstetrical Forceps Design

The obstetrical forceps have 2 branches each of which consists of three parts: spoon proper, lock part and handle. On external side of forceps near the castle there are tabs, called Bush hooks. Most types of forceps have two curvatures – one for head and one for pelvis.

### Indications against Use of Forceps

- dead fetus;
- hydrocephalus or microcephalus;
- anatomically and clinically narrow pelvis (II - III degree of narrowing);
- incomplete opening of cervix;
- forehead praevia and front view of face praevia;
- position of head by small or large segment at the entrance to pelvis;
- threatening or beginning uterine rupture;
- pelvic praevia of fetus.

### Conditions for Use of Forceps during Delivery:

1. Full opening of cervix .
2. Break of the water bag.
3. Empty bladder.
4. Head previa and head's placement in cavity or in the outlet of small pelvis.
5. Size of head of fetus corresponding to size of the woman's pelvis.
6. Average size of head.
7. Living fetus.

### Indications for Use of Forceps during Delivery:

1. Indications on the part of woman:
  - weak uterine contractility, unable to medical therapy; fatigue; weak labor pushing;
  - bleeding from the uterus at the end of the first and second periods of delivery;
  - indications against labor pushing (severe gestosis; extragenital cardiovascular and renal pathology; myopia of high degree; fever and intoxication); severe neuropsychiatric disorders;
2. Indications on the part of fetus:
  - acute fetal hypoxia;
  - umbilical cord prolapse;
  - threat of birth trauma.

### Stages in Use of Forceps during Delivery:

- insertion of branches of forceps after vaginal examination;
- locking of forceps;
- trial traction;
- traction proper to extract fetus;
- removing of forceps.

#### Three Triple Rules for Correct Use of Forceps in Delivery:

1. About the sequence of insertion of branches of forceps:
  - left branch inserted by left hand in the left half of the mother's pelvis ("three on the left"), under control of right hand;
  - right spoon is inserted by right hand in the right half of the mother's pelvis under control of left hand ("three on the right").

#### Difficulties and Complications When Forceps Are Used in Delivery and Removal of Fetus:

1. Difficulty of injecting branches due to narrow entrance to vagina. In this case it is necessary to do episiotomy beforehand.
2. Difficulty of injecting branches due to obstacles in pelvic cavity. In this case it is necessary to stop injecting branches, pull them out and examine anew the right placement of the branches.
3. Inability to apply forceps as they are on different planes. In order to correct it, it is necessary to change the position of one of the branches; if it cannot be done then the forceps should be pulled out and applied again.

#### Three Triple Rules for Correct Use of Forceps in Delivery:

2. Orientation of branches on head of the fetus:
  - the tops of branches of forceps should be turned towards lowest point of head;
  - forceps should capture the parietal mounds of fetus;
  - lowest point of head must lie in cavity of tongs.

#### Difficulties and Complications When Forceps Are Used in Delivery and Removal of Fetus:

4. Forceps cannot hold head of fetus. It is usually associated with wrong placement of branches on parietal bones. The forceps should be pulled out and applied again.
5. Inability to pull out the head due to significant narrowing of pelvic cavity. If this condition was underestimated before the operation, you must remove the forceps and proceed to fetal destruction and extraction.

#### Three Triple Rules for Correct Use of Forceps in Delivery:

3. About direction of tractions at various points in the axis of pelvis:
  - in plane of inlet it should go down to the seated obstetrician's toes;
  - in the pelvic cavity it should go horizontally towards obstetrician's knees;
  - in plane of outlet it should go from the bottom up towards seated obstetrician's face.

#### Difficulties and Complications When Forceps Are Used in Delivery and Removal of Fetus:

1. In mother: damage to soft vaginal tissue; tear of pubic joint; damage to sciatic nerve roots followed by lower limbs paralysis; bleeding; rectal rupture; formation of urethro-vaginal fistula.
2. In fetus: head bruises; facial nerve cut; damage to eyes; damage to bones: impression, fractures, gap between occipital bone and the base of the skull; compression of brain; bleeding in skull cavity.
3. Postpartum infectious complications.

## 77. Forceps: indications, contra-indications, conditions for forceps. Technique

### Complication FORCEPS DELIVERY

**INCIDENCE OF FORCEPS DELIVERY.** In general, there has been a decline in operative vaginal deliveries with a parallel increase in cesarean deliveries over the

past two decades reported that the cesarean delivery rate expressed per 100 deliveries had increased from 16.5 in 1980 to 22.9 in 2000. During this same time period, forceps delivery expressed per 100 vaginal deliveries had decreased from 17.7 to 4.0, while the vacuum delivery rate increased from 0.7 to 8.4. Chang and colleagues reported that the rate of forceps delivery decreased over time while the rate of vacuum delivery increased.

These authors also evaluated the impact of gender of the attending physician on operative vaginal delivery rates. The authors concluded that gender per se did not have a significant impact on either the forceps or vacuum delivery rate, when controlled for the year in which the procedure was performed.

**FUNCTION OF FORCEPS.** Although the most important function of forceps is traction, forceps may be invaluable for rotation, particularly for occiput transverse and posterior positions. In general, Simpson forceps are used to deliver the fetus with a molded head, as is common in nulliparous women. The Tucker-McLane instrument is often used for the fetus with a rounded head, which more characteristically is seen in multiparas. In most situations, however, either instrument is appropriate.

**Forces Exerted by the Forceps.** The force produced by the forceps on the fetal skull is a complex function of pull and compression by the forceps and friction produced

by the maternal tissues. It is impossible to ascertain the amount of force exerted by forceps for an individual patient.

**INDICATIONS FOR FORCEPS.** Termination of the second stage of labor by forceps delivery or vacuum extraction is indicated in any condition threatening the mother or fetus that is likely to be relieved by delivery. Some maternal indications include heart disease, pulmonary injury or compromise, intrapartum infection, certain neurological conditions, exhaustion, or prolonged second-stage labor. The latter is defined as more than 3 hours with, and more than 2 hours without, regional analgesia in the nulliparous woman. In the parous woman, a prolonged second stage is defined as more than 2 hours with, and more than 1 hour without, regional analgesia.

Shortening of second-stage labor for maternal reasons should generally be accomplished with either outlet or low forceps. Fetal indications for operative vaginal delivery with either forceps or vacuum include prolapse of the umbilical cord, with the other requisites for instrument delivery present; premature separation of the placenta; or a nonreassuring fetal heart rate pattern.

**Elective and Outlet Forceps.** Forceps generally should not be used electively until the criteria for outlet forceps have been met. The fetal head must be on the perineal floor with the sagittal suture no more than 45 degrees from the anteroposterior diameter. In these circumstances, forceps delivery is a simple and safe operation. Carmona and associates (1995) reported no differences in maternal or infant outcomes with term pregnancies randomized to spontaneous or elective outlet forceps delivery. There is, however, no evidence that use of prophylactic forceps is beneficial in the otherwise normal term labor and delivery.

- P1. The head must be engaged. Extensive caput succedaneum formation and molding sometimes make determination of the station of the fetal head difficult.
2. The fetus must present as a vertex or by the face with the chin anterior.
3. The position of the fetal head must be precisely known.
4. The cervix must be completely dilated.
5. The membranes must be ruptured.
6. There should be no suspected cephalic-pelvic disproportion.

#### **PROPHYLACTIC OUTLET FORCEPS FOR LOW-BIRTHWEIGHT FETUSES.**

reported no significant differences in outcomes in neonates who weighed 500 to 1500 g and who were delivered spontaneously or by outlet forceps. Schwartz and colleagues (1983) reported similar findings. Currently, it would appear that there is no obvious advantage to routine outlet forceps delivery of a small fetus. Prerequisites for Forceps Application. There are at least six prerequisites for successful application of forceps:

1. The head must be engaged. Extensive caput succedaneum formation and molding sometimes make determination of the station of the fetal head difficult. When difficulties of station assignment occur, it is important to realize that a "low forceps" procedure may actually be a more difficult midforceps operation.
2. The fetus must present as a vertex or by the face with the chin anterior.
3. The position of the fetal head must be precisely known.
4. The cervix must be completely dilated.
5. The membranes must be ruptured.
6. There should be no suspected cephalic-pelvic disproportion.

#### **78. Vacuum-extraction: indications, contra-indications, conditions and technique;**

#### **complications for mother and fetus.**

##### **Vacuum-extraction of Fetus**

Vacuum-extraction of fetus is a method of delivery designed to extract living fetus by the head with the help of vacuum extractor. Frequency of application of vacuum extraction is 0.12 - 0.20 % of all births. Nowadays, its application is increasingly rare, due to the expansion of indications for Cesarean section in the interests of fetus.

##### **Indications for Vacuum Extraction**

- weakness of labor that cannot be corrected by conservative therapy;
- fetal distress;
- beginning of intrauterine hypoxia;
- deep transverse arrest.

##### **Types of Vacuum Extractor**

- Malstrom vacuum extractor consists of metal cup (7.6-15.2 cm in diameter) applied on the head of the fetus. Under the cup there is negative pressure of not more than 0.7-0.8 kg/cm<sup>2</sup>. Then traction is produced pull out the head of the fetus through birth canal.
- Plastic cup extractor has a soft flexible cup that can be fixed more easily on the head of the fetus. Its use is less traumatic. Negative pressure is up to 0.7-0.8 kg/cm<sup>2</sup>.

##### **Contraindications to Vacuum Extraction:**

- dead fetus;
- incomplete disclosure of cervix;
- hydrocephaly and anencephaly;
- anatomically (II - III degree of narrowing) and clinically narrow pelvis;
- anterior high longitudinal position;
- gestational age less than 36 weeks.
- obstetric complications (preeclampsia, eclampsia, hypertension, coronary diseases with decompensation events and so on).

## Complications:

### Conditions for Operation:

1. Full disclosure of cervix.
2. Lack of amnion.
3. Size of pelvis and head correspond to each other.
4. Occipital presentation.
5. Living fetus.
6. Bladder is fully emptied.

1. In mother: tears in perineum and vagina, small and large labia, clitoris, cervix, rarely also in lower segment of uterus, bladder, symphysis.
2. In fetus: abrasions and lacerations on the head (12,6 %); cephalohematoma (6 %); intracranial hemorrhage (0,35 %); central nervous system disorders (in 20.2 % of children when vacuum extractor is applied because of hypoxia).

### Protocol of Vacuum Extraction:

1. Cup is taken by the right hand and injected sideways in vagina. The movement is controlled by the fingers of the left hand. The choice of the cup size depends on the size of vagina and perineum.
2. Cup is put on the head of the fetus in the vicinity of small fontanel (ideal type of fixation). Negative pressure is produced for 2-4 minutes.
3. With fingers positioned on the hose of the cup, do tractions during each labor attempt. Direction of tractions should correspond to natural mechanism of delivery.
4. After delivery of parietal bones eliminate negative pressure and take off the cup from the head of the fetus.
5. Following that use manual techniques to pull out the head of the fetus. It is necessary to complete delivery in 15-20 minutes.

### 78. Vacuum-extraction: indications, contra-indications, conditions and technique;

#### complications for mother and fetus.

INDICATIONS AND PREREQUISITES. Generally, the indications and prerequisites for the use of the vacuum extractor for delivery are the same as for forceps delivery (the tendency to attempt vacuum deliveries at stations higher than is usually attempted with forceps is worrisome).

Contraindications to vacuum extraction include operator inexperience, inability to assess fetal position, high station, and suspicion of cephalopelvic disproportion.

Relative contraindications for delivery using vacuum extraction include face or other nonvertex presentations, fetal coagulopathy, known macrosomia, and recent scalp blood sampling. Generally, vacuum extraction is reserved for fetuses 34 weeks or older.

CMI Tender Touch extractor cup.

#### TECHNIQUE.

Proper cup placement is the most important determinant of success in vacuum extraction. The center of the cup should be over the sagittal suture and about 3 cm in front of the posterior fontanelle toward the face.

Anterior placement on the fetal cranium near the anterior fontanelle rather than over the occiput will result in cervical spine extension unless the fetus is small.

Similarly, asymmetrical placement relative to the sagittal suture may worsen asynclitism

Cup placement for elective use in occiput anterior positions is seldom difficult. In contrast, when the indication for delivery is failure to descend caused by occipital malposition, with or without asynclitism or deflexion, cup placement can be very difficult

Entrapment of maternal soft tissue predisposes the mother to lacerations and hemorrhage and virtually assures cup "pop-off." The full circumference of the cup should be palpated both before and after the vacuum has been created, as well as prior to traction. When using rigid cups, it is recommended that the vacuum be created gradually by increasing the suction by 0.2 kg/cm<sup>2</sup> every 2 minutes until a negative pressure of 0.8 kg/cm<sup>2</sup> is reached. With soft cups, negative pressure can be increased to 0.8 kg/cm<sup>2</sup> over as little as 1 minute

Some authors suggest that 0.6 kg/cm<sup>2</sup> is the

Traction should be intermittent and coordinated with maternal expulsive efforts.

Traction may be initiated by using a two-handed technique,, the fingers of one hand are placed against the suction cup, while the other hand grasps the handle of the instrument.

A theoretical advantage of the vacuum cup is that it usually will detach prior to creating tractive forces sufficient to cause fetal injury. Vacuums offer no advantage for avoidance of shoulder dystocia.

**COMPLICATIONS.** Complications of the vacuum extractor include scalp lacerations and bruising, subgaleal hematomas, cephalohematomas, intracranial hemorrhage, neonatal jaundice, subconjunctival hemorrhage, clavicular fracture, shoulder dystocia, injury of sixth and seventh cranial nerves, Erb palsy, retinal hemorrhage, and fetal death. Significant scalp injuries, hematomas, and resulting hyperbilirubinemia are more common with the metal cup instruments compared with the soft cup devices . the

Malmstrom vacuum extractor, scalp injury ranged from 0.8 to 33 percent, cephalohematoma from 1 to 26 percent, and subgaleal hemorrhage from 0 to 10 percent. . Conversely, found no increase in serious neonatal morbidity, including retinal hemorrhage, for the Silastic vacuum extractor compared with that associated with spontaneous

delivery.

The Food and Drug Administration (FDA) regarding the possible association of vacuum-assisted delivery with serious fetal complications, including death. During a 4-year period, the FDA received reports of nine serious fetal injuries and 12 newborn deaths, which was a significant increase over the preceding 11 years.

#### **79. Postpartum mastitis: etiology, classification, clinical features, diagnosis, treatment.**

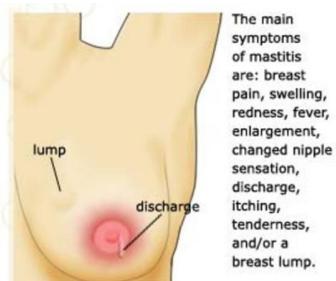
##### **COMPLICATIONS OF THE PUPERIUM**

###### **Mastitis**

Parenchymatous infection of the mammary glands is a rare complication antepartum but is occasionally observed during the puerperium and lactation. Symptoms of suppurative mastitis seldom appear before the end of the first week postpartum and not until the third or fourth week. Infection almost invariably is unilateral, and marked engorgement usually precedes the inflammation.

The first sign of inflammation is chills or actual rigor, soon followed by fever and tachycardia. The breast becomes hard and reddened, and the woman complains of severe pain.

###### **SYMPTOMS OF MASTITIS**



The main symptoms of mastitis are: breast pain, swelling, redness, fever, enlargement, changed nipple sensation, discharge, itching, tenderness, and/or a breast lump.

###### **ETIOLOGY OF MASTITIS AND MAMMARY ABSCESS**

The immediate source of organisms that cause mastitis is almost always the infant's nose and throat:

*Staphylococcus aureus*

*coagulase-negative staphylococci*

*viridans streptococci*

###### **TREATMENT OF MASTITIS AND MAMMARY ABSCESS**

Most are community-acquired organisms, and even staphylococcal infections are usually sensitive to penicillin or a cephalosporin. Beta-lactam antibiotics (Dicloxacillin, Amoxicillin, Flucloxacillin 500 mg orally four times daily) may be started. Erythromycin is given to women who are penicillin sensitive. If

the infection is caused by resistant, penicillinase-producing staphylococci, or if resistant organisms are suspected while awaiting the results of culture, an antimicrobial such as vancomycin, which is effective against methicillin-resistant *S aureus*, should be given. Treatment should be continued for 10 to 14 days.

#### **80. Postpartum endometritis: etiology, clinical features, diagnosis and treatment.**

##### **ENDOMETRITIS**

Postpartum uterine infection is called endometritis, endomyometritis or endoparametritis. Because infection actually involves not only the decidua but also the myometrium and parametrial tissues, the preferred term is metritis with pelvic cellulitis.

Predisposing factors are:

the route of the delivery (especially cesarean section);

bacterial colonization of the lower genital tract with certain microorganisms: group B streptococcus, Chlamydia trachomatis, Mycoplasma hominis, Ureaplasma urealyticum and Gardnerella vaginalis.

Other factors that are associated with an increased risk of infection include

cesarean delivery for multifetal gestation;

young maternal age;

nulliparity;

prolonged labor induction;

obesity;

meconium-stained amniotic fluid.

Clinical course of endometritis

Fever exceeding 38 to 39°C is the most important criterion for the diagnosis of postpartum metritis.

Chills may accompany fever and suggest bacteremia in women with pelvic infection following cesarean delivery.

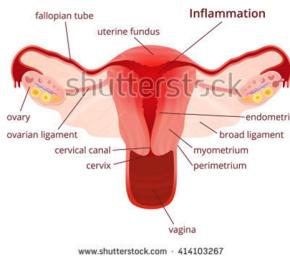
Women usually complain of abdominal pain. Parametrial tenderness is found on abdominal and bimanual examination.

Many women have foul-smelling lochia without evidence for infection. Other infections, notably those due to group A  $\beta$ -hemolytic streptococci, are frequently associated with scanty, odorless lochia.

Leukocytosis may range from 15,000 to 30,000 cells/mL.

## **ENDOMETRITIS**

is inflammation of the endometrium



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### TREATMENT OF ENDOMETRITIS

If mild metritis develops after the woman has been sent home following vaginal delivery, the usual treatment is with an oral antimicrobial agent.

For moderate to severe infections, including those following cesarean delivery, intravenous therapy with a broad-spectrum antimicrobial regimen is indicated. Improvement follows in 48 to 72 hours in women treated with one of several regimens. If fever persists after this interval, a doctor must perform a careful search for causes of refractory pelvic infection.

Complications of metritis include a parametrial phlegmon or an area of intense cellulitis, a surgical incisional or pelvic abscess, an infected hematoma, and septic pelvic thrombophlebitis. A patient is discharged after she has been afebrile for at least 24 hours. Further oral antimicrobial therapy is not needed.

#### Specific antimicrobial treatment

Broad-spectrum antimicrobials are often not necessary to treat infection following vaginal delivery. As many as 90% of these infections respond to regimens such as ampicillin + gentamicin.

The clindamycin-gentamicin regimen for treatment of pelvic infection following cesarean delivery now is considered to be the standard. Because enterococcal infections may persist despite this standard therapy, ampicillin may be added to the clindamycin-gentamicin regimen, either initially or if there is no response by 48 to 72 hours.

$\beta$ -lactam antimicrobials include activity against many anaerobic pathogens (cephalosporins as well as extended-spectrum penicillins). Beta-lactam antimicrobials are safer, and except for allergic reactions, are less toxic.

The  $\beta$ -lactamase inhibitors, clavulanic acid, sulbactam, and tazobactam, are combined with ampicillin, amoxicillin, ticarcillin, and piperacillin to extend their spectra.

Metronidazole has superior activity against most anaerobes.

### **81. Postpartum peritonitis: etiology, clinical features, diagnosis and treatment.**

#### INFECTIONS OF THE PERINEUM

Episiotomy infections do not occur often because the operation is performed much less frequently now than in the past. With infection, there is a risk of disruption.

Other factors include coagulation disorders, smoking, and human papillomavirus infection.

Local pain and dysuria, with or without urinary retention, are common symptoms. The most common findings are pain, purulent discharge, and fever. In extreme cases, the entire vulva may become edematous, ulcerated, and covered with exudate.

#### Treatment

Infected episiotomies, like other infected surgical wounds, should be treated by establishing drainage. In most cases, sutures are removed and the infected wound is opened. In some women with obvious cellulitis but no purulence, broad-spectrum antimicrobial therapy with close observation is appropriate.

Early repair is recommended after the evidence of infection subsided.

The average duration from the disruption to episiotomy repair is 6 days.

#### **82. Postpartum sepsis: etiology, clinical features, diagnosis and treatment.**

Sepsis can develop as the result of many complications. Here are just a few:

Miscarriages (spontaneous abortions) or induced abortions: Infections are a risk after any miscarriage or abortion. Non-sterile abortions, those that may be done outside of a healthcare facility, are a particular risk. Women who have had one should watch for signs and symptoms of an infection (lasting or increasing pain, discolored or odorous (smelly) discharge, abdominal tenderness, high temperature, fatigue, feeling unwell).

Cesarean sections: Sepsis can develop after any type of surgery. Cesarean sections are major abdominal surgeries with all the associated risks. See Sepsis and Surgery for more information.

Prolonged or obstructed labor: An unusually long time of labor or labor that stops progressing.

Ruptured membranes: The longer the period between the “water breaking” and the baby’s birth, the higher the chance of an infection.

Infection following vaginal delivery: Although not common in the developed world among women who give birth in healthcare facilities, infections are very common in the developing world.

Mastitis: Infection in the breasts can trigger sepsis.

Viral or Bacterial Illnesses: Any illness that raises the risk of sepsis in the general population will do so in pregnant women as well. For example, see: Sepsis and Influenza, Sepsis and HIV/AIDS and Sepsis and MRSA

Who is at risk?

Any woman who is pregnant, has miscarried or aborted, or who has delivered a child is at risk of developing maternal or postpartum sepsis. However, some women do have a higher risk than do others. This includes women who have a history of congestive heart failure, liver disease, or lupus

Women who may be more prone to getting an infection, which can lead to sepsis, are those:

With diabetes (see Sepsis and Diabetes)

Who undergo invasive procedures to help them get pregnant

Who undergo invasive tests during pregnancy

Diagnosis

Diagnosing sepsis in a pregnant woman or one who has recently given birth can be challenging. Pregnancy and delivery causes many changes in the body, including a faster heart beat, changes in blood pressure, and faster breathing. Usually, these are signs that may alert a healthcare provider that there may be something wrong, such as an infection. Also, many women get chills and sweat heavily after giving birth. They may also have pain, or feel dizzy or light headed.

It also may be more difficult to diagnose infections in pregnant and postpartum women. For example, urinary tract infections usually cause a frequent need to urinate, but this can happen because of pregnancy alone. So if a woman is going to the bathroom a lot, she may just chalk it up to being pregnant and not realize that she has an infection.

Treatment

Treatment depends on the underlying cause.

If tissue is seen at the cervical opening it should be removed.

In those in who the pregnancy is in the uterus and who have fetal heart sounds, watchful waiting is generally appropriate.

Anti-D immune globulin is usually recommended in those who are Rh-negative. Occasionally surgery is required.