

Quadrant II – Notes

Programme: B.Sc. (Hons.) Home Science (First Year)

Subject: Core Course

Course Code: CC - 1

Course Title: Human Development 1: The Childhood Years

Unit: 02 – Prenatal Development, Birth, Neonate

Module Name: Conception, Pregnancy, Birth

Module No: 06

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Notes :

STAGES OF PRENATAL DEVELOPMENT

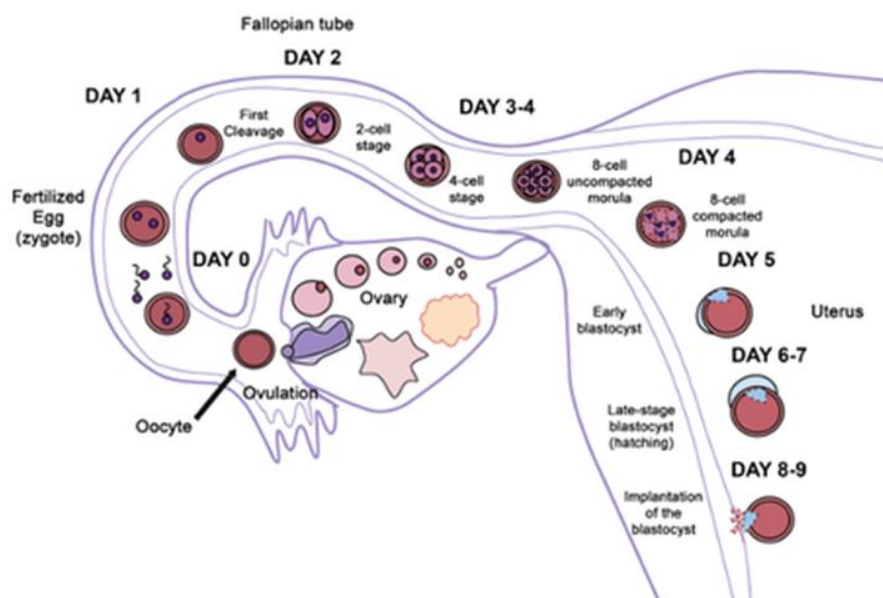
Prenatal development begins with fertilization, the union of a male sperm cell and a female egg cell to form a new organism and ends with birth, human life begins at conception. The prenatal development is sometimes divided into trimesters and 3 periods germinal, embryonic and fetal.

FIRST TRIMESTER

GERMINAL STAGE (first 2 weeks after conception)

- The first and shortest of the stages of the human lifespan.
- It lasts a total of 8 to 9 days.
- Each month a group of eggs (called oocytes) is recruited from the ovary for ovulation (release of the egg). The eggs develop in small fluid-filled cysts called follicles.
- Normally, one follicle in the group is selected to complete maturation. This dominant follicle suppresses all the other follicles in the group, which stop growing and degenerate.
- The mature follicle opens and releases the egg from the ovary (ovulation). Ovulation generally occurs about two weeks before a woman's next menstrual period begins.

- After ovulation, the ruptured follicle develops into a structure called the corpus luteum, which secretes progesterone and estrogen.
- Germinal stage begins in a fallopian tube when an ovum is fertilized by a sperm to form a zygote (day 0).
- The zygote undergoes several initial cell divisions to form a solid ball of cells called a morula (days 3-4).
- The morula undergoes additional changes to become a hollow ball of cells called a blastocyst (days 5-7).
- The germinal stage ends when the blastocyst implants in the endometrium of the uterus (days 8-9).
- After implantation occurs, the blastocyst is called an embryo, and will soon obtain nutrients from the mother's blood via a temporary organ called the placenta.



Processes in the Germinal Stage

Fertilization

- Takes place when a haploid sperm successfully enters a haploid egg and triggers the egg to complete meiosis II.
- The sperm also undergoes changes. Its tail falls off and its nucleus fuses with the nucleus of the egg.
- Fertilization results in a single diploid cell called a zygote.

- The nucleus of the zygote contains 46 chromosomes: 23 chromosomes from the nucleus of the egg and 23 chromosomes from the nucleus of the sperm.
- Fertilization usually takes place in the ovary end of a fallopian tube.

Cleavage

- By second day after fertilization, the single – celled zygote undergoes mitosis to form two daughter cells.
- Mitosis continues taking place every 12 to 24 hours to produce first four, the eight and as many as sixteen cells by day 4.
- These early mitotic divisions are called cleavage.
- By day 4, the cells form a solid ball called a morula.
- Although, cleavage results in more cells, the overall mass of cells making up the morula is still the same size as the initial zygote.

Blastulation

- The process of changing the morula into a blastocyst.
- It occurs from roughly day 5 to day 7 after fertilization.
- The morula changes from a solid ball of undifferentiated cells into a fluid-filled ball of differentiated cells.
- The major parts of the fully formed blastocyst are the embryoblast, trophoblast and blastocoele.
 - **Embryoblast** – consists of a mass of cells inside the blastocyst. These cells migrate to one end of the blastocyst. Embryoblast cells are differentiated cells that will eventually develop into the embryo.
 - **Trophoblast** – the outer cell layer of the blastocyst. Trophoblast cells are differentiated cells that will implant in the uterus and eventually develop into the fetal portion of the placenta and other extraembryonic tissues.
 - **Blastocoele** – is a cavity formed by the migration of embryoblast cells to one pole of the blastocyst. The blastocoele fills with fluid secreted by trophoblast cells.

Implantation

- Around day 8 or 9 after fertilization, implantation begins.

- It is the process in which a blastocyst becomes embedded in the endometrium of the uterus.
- Implantation is triggered by contact between the blastocyst and endometrium.
- The hatched trophoblast cells start secreting enzymes that digest the mucosa covering the endometrium and break down the extracellular matrix between endometrial cells.
- These changes allow finger- like projections of the trophoblast to penetrate into the endometrium.
- The projections pull the blastocyst now called an embryo – into the endometrium until it is fully covered by endometrial epithelium

EBRYONIC STAGE (2 – 8 weeks after conception)

- It lasts from implantation through the eight week of pregnancy.
- The most rapid prenatal changes take place, as the groundwork is laid for all body structures and internal organs.
- All parts of the body are forming.
- The embryo is vulnerable to interference with healthy development.
- Last half of the first month- in the first week of this period, the embryonic disk forms three layers of cells
- **ECTODERM** – which become the nervous system and skin.
- **MESODERM**- which develop the muscles, skeleton, circulatory system and other internal organs.
- **ENDODERM** – which will become the digestive system, lungs, urinary tract and glands.
- As the three layers form, life support systems for the embryo develop rapidly.
- Life support system – amnion, umbilical cord, placenta
- **AMNION** – is like a bag or an envelope and contains clear fluid in which the developing embryo floats. The amniotic fluid provides an environment that is temperature and humidity controlled, as well as shock-proof.
- **UMBILICAL CORD** – contains two arteries and one vein and connects the baby to the placenta.
- **PLACENTA** – consists of a disk shaped group of tissues in which small blood vessels from the mother and the offspring intertwine but do not join.

- By the time most women know they are pregnant, the major organs have begun to form.
- **Organogenesis** is the name given to the process of organ formation during the first two months of prenatal development.
- At first, the nervous system develops fastest.
- The ectoderm folds over to form the neural tube or primitive spinal cord.
- At 3 1/2 weeks, the top swells to form the brain.
- The nervous system is developing, the heart begins to pump blood and muscles, backbone, ribs and digestive tract appear.
- At the end of the first month, the curled embryo only 1/4 inch long consists of millions of organized groups of cells with specific functions.
- Second month – growth continues rapidly.
- Eyes, ears, nose, jaw and neck form.
- Tiny buds become arms, legs, fingers and toes.
- Internal organs are more distinct: the intestines grow, the heart develops separate chambers and liver and spleen take over production of blood cells so that the yolk sac is no longer needed.
- Changing body proportions cause the embryo's posture to become more upright.
- At 7 weeks, production of neurons begin deep inside the neural tube.
- Once formed, neurons begin travelling along tiny threads to their permanent locations, where they will form the major parts of the brain.
- End of the period – embryo about 1 inch long and half ounce in weight, can sense its world.
- Responds to touch, particularly in the mouth area and on the soles of the feet.
- Movement starts, although its tiny flutters are still too light to be felt by the mother.

FETAL STAGE

- Period of the fetus from the 9th week to the end of pregnancy, longest prenatal period.
- Third month – the organs, muscles and nervous system start to become organized and connected.
- When the brain signals, the fetus kicks, bends its arms, forms a fist, curls its toes, turns its head, opens its mouth, sucks its thumb, stretches and yawns.

- Tiny lungs begin to expand and contract in an early rehearsal of breathing movements.
- 12th week – external genitals are well formed and the sex of the fetus can be detected with ultrasound
- Other finishing touches appear, such as fingernails, toenails, tooth buds and eyelids.
- Heartbeat can be heard through a stethoscope.

SECOND TRIMESTER

- New being has grown large enough that the mother can feel its movements.
- A white, cheeselike substance called vernix covers the skin, protecting it from chapping during the long months spent in the amniotic fluid.
- White, downy hair called lanugo also covers the entire body, helping the vernix stick to the skin.
- Many organs are well – developed during second trimester
- Most of the brain's billion of neurons are in place; few will be produced after this time.
- Glial cells, which support and feed the neurons, continue to increase rapidly throughout pregnancy and after birth.
- Brain weight increases, same time, neurons begin forming synapses, or connections.
- 20 week fetus can be stimulated as well as irritated by sounds.
- Slow eye movements appear, with rapid eye movements following at 22 weeks.

THIRD TRIMESTER

- A fetus born early has a chance of survival.
- The point at which the baby can first survive, called the age of viability (22 and 26 weeks)
- Baby born between the seventh and eighth months, usually needs oxygen assistance to breathe.
- Brain's respiratory centre is now mature, tiny air sacs in the lungs are not yet ready to inflate and exchange carbon dioxide for oxygen.
- Cerebral cortex, the seat of human intelligence, enlarges.
- As neural connectivity and organization improve, the fetus spends more time awake.
- 28 weeks – fetuses are awake 11% of the time.

- 30-34 weeks : fetuses show rhythmic alternations between sleep and wakefulness that gradually increase in organization.
- Higher fetal activity in the last weeks of pregnancy predicts a more active infant in the first month of life.

In the final three months, the fetus gains more than 5 pounds and grows 7 inches. As it fills the uterus, it gradually moves less often. In addition, brain development, which enables the organism to inhibit behaviour, contributes to this decline in physical activity. In the 8th month, a layer of fat is added to assist with temperature regulation. The fetus also receives antibodies from the mother's blood to protect against illnesses, since the new-born's immune system will not work well until several months after birth. In the last weeks, most fetuses assume an upside – down position, partly because of the shape of the uterus and also because the head is heavier than the feet. Growth slows and birth is about to take place.

P R E N A T A L E N V I R O N M E N T I N F L U E N C E S

- ❖ **TERATOGENS** – they are the environmental agents that cause damage during the prenatal period.
- ❖ The harm done by teratogens depends on the following factors:
 - Dose
 - Heredity
 - Negative influences
 - Age
- ❖ In the period of the zygote, before implantation, teratogens rarely have any impact. The embryonic period is the time when serious defects are most likely to occur because the foundations for all body parts are being laid down. During the fetal period, teratogenic damage is usually minor.

❖ **V A R I E T Y O F T E R A T O G E N S**

1. PRESCRIPTION AND NON-PRESCRIPTION DRUGS

- In the year 1960s (Moore & Persaud, 2008), a sedative called thalidomide was widely available in Canada, Europe and South America. When taken by mothers 4 to 6 weeks after conception, it provided gross deformities of the embryo's developing arms and legs, damage to ears, heart, kidneys and genitals. About 7,000 infants were affected. At later stages as the children grew older it damaged their CNS which impaired their intellectual development.
- Another medication, synthetic hormone, diethylstilbestrol (DES), prescribed to prevent miscarriages. As daughters of these mothers reached adolescence and young adulthood, they showed high rates of cancer of the vagina, malformations of the uterus and infertility. Young men showed an increased risk of genital abnormalities and cancer of the testes.
- The most widely used potent teratogen is a vitamin A derivative Accutane (Isotretinoin), prescribed to treat severe acne. Exposure during the first trimester of pregnancy results in eye, ear, skull, brain, heart, and immune system abnormalities.
- Any drug with a molecule small enough to penetrate the placental barrier can enter the embryonic or fetal bloodstream.
- Aspirin is one of the most common, regular use is linked to low birth weight, infant death, poorer motor development, low intelligence score.
- Antidepressant medications are linked to increased risk of premature delivery and birth complications, including respiratory distress and persistent high blood pressure in infancy.

2. ILLEGAL DRUGS

- Cocaine and heroin are highly addictive mood altering drugs.
- Babies born are at risk for a variety of problems, including prematurity, low birth weight, physical defects, breathing difficulties.
- Infants born are feverish and irritable and trouble sleeping.
- Less attentive to the environment, slow motor development.
- Research evidence : cocaine constricts the blood vessels, causing oxygen delivery to the developing organism to fall for

15 minutes following a high dose. It can alter the production and functioning of neurons and the chemical balance in the fetus's brain. These effects may contribute to physical defects, including eye, bone, genital, urinary tract, kidney and heart deformities, brain haemorrhages and seizures and severe growth retardation. (Covington et. al, 2002)

- Problems can persist in preschool and school years. Perceptual, motor, attention, language, memory, impulse control.
- Another drug – Marijuana exposure linked to smaller head size, difficulty in attention, memory, overactivity, depression, anger and aggression in childhood and adolescence.

3. TOBACCO

- Effect of smoking during prenatal period is low birth weight.
- Serious consequences – miscarriage, prematurity, cleft lip and palate, impaired heart rate and breathing during sleep, infant death and asthma and cancer later in childhood also increase.
- New-borns of smoking mothers are less attentive to sounds, more muscle tension, more excitable when touched and visually stimulated and more often have colic (persistent crying).
- Smoking can harm the fetus, how nicotine can affect
 - ✓ Constricts blood vessels – lessens the blood flow to uterus – placenta grow abnormal.
 - ✓ Raise concentration of carbon monoxide – damage CNS – slow growth.
 - ✓ Passive smoking does impact too.

4. ALCOHOL

- FASD – Fetal Alcohol Spectrum Disorder
- A range of physical, mental and behavioural outcomes caused by prenatal alcohol exposure.

Children with FASD are given one of three diagnoses:

- a. FAS – Fetal Alcohol Syndrome : slow physical growth, pattern of three facial abnormalities(short eyelid openings, thin upper lips, smooth or flattened philtrum), brain injury (evident in small head and impairment in areas of functioning. Other defects include urinary tract, eyes, heart, genitals, etc.

- b. p-FAS : Partial Fetal Alcohol Syndrome ; two of the three facial abnormalities, brain injury.
 - c. ARND – Alcohol related neurodevelopmental disorder : 3 areas of mental functioning are impaired.
- Later effects – keeping a routine job, poor judgement, motor coordination deficits, poor school performance, trouble with law, inappropriate social and sexual behaviours, alcohol and drug abuse and lasting mental health problems including high stress reactivity and depression.
- How alcohol produce devastating effects
 - a. Interferes with production and migration of neurons in the primitive neural tube
 - b. EEG and fMRI reveals reduced brain size, damage to many brain structures
 - c. Body uses large quantities of oxygen to metabolize alcohol. Pregnant woman’s heavy drinking draws away oxygen that the developing organism needs for cell growth.

5. RADIATION

- Ionizing radiation can cause mutation, damaging DNA in ova and sperm.
- If mothers are exposed, additional harm to the embryo or fetus.
- Defects : incidence of miscarriage, underdeveloped brains, physical deformities, slow physical growth.
- Even low level radiation as the result of industrial leakage or medical x-rays can increase the risk of childhood cancer.
- Low intelligence test scores, language and emotional disorders are some of the impacts.

6. ENVIRONMENTAL POLLUTION

- Prenatal exposure to traffic related air pollution due to residence near roadways is linked to lower birth weight with complicated pregnancies at greater risk.
- Certain pollutants cause severe prenatal damage. Industrial plant waste containing high levels of mercury caused physical deformities, intellectual disability, abnormal speech, difficulty in chewing and swallowing.

- High levels of prenatal mercury exposure disrupt production and migration of neurons causing widespread brain damage.
- Prenatal mercury exposure from maternal seafood diets, assessed by measuring mercury concentration in umbilical cord blood and tissue, predicts deficits in speed of cognitive processing and motor, attention and verbal test performance during the school years.
- Predatory fish contaminated with mercury – swordfish, albacore tuna and shark.
- Polychlorinated biphenyls (PCBs) – prenatal exposure resulted in low birth weight, discoloured skin, deformities of gums and nails.
- Lead – present in paint flaking off the walls of old buildings. Prenatal exposure related to prematurity, low weight, brain damage, physical defects.
- Dioxins -toxic compounds resulting from incineration linked to brain, immune system and thyroid damage in babies and breast and uterine cancers in women

7. MATERNAL DISEASE

- Various virus if strike during prenatal development can have serious impact
- Rubella(German Measles) – if mothers become ill during that time show deafness, eye deformities, including cataracts, heart, genital urinary, intestinal m bone, dental defects, intellectual disability.
- HIV (Human Immunodeficiency Virus) can lead to acquired immune deficiency syndrome(AIDS), a disease that destroys the immune system. It rapidly progresses in infants causing brain damage, seizures, gradual loss in brain weight, delayed mental and motor development
- Several bacterial and parasitic diseases too have an impact
- Toxoplasmosis, caused by a parasite found in animals.
- Pregnant women may become infected from eating raw or uncooked meat or from contact with the feces of infected cats.

OTHER MATERNAL FACTORS

1. EXERCISE

- In healthy physically fit women regular moderate exercise such as walking, swimming, biking or an aerobic workout is related to increased birth weight and a reduction for certain complications such as pregnancy induced maternal diabetes and high blood pressure
- Vigorous extended exercise- working up a sweat for more than 30 minutes especially late in pregnancy -results in lower birth weight than in healthy.

2. NUTRITION

- Consequences of prenatal malnutrition
 - ❖ Serious damage to CNS
 - ❖ Poor mother's diet, greater the loss in the brain weight (Last Trimester)
 - ❖ Inadequate diet can distort the structure of organs – Livelong Health problems
 - ❖ Poor immune system
 - ❖ Respiratory illnesses, irritable
- Prevention and treatment
 - ❖ Folic Acid Supplement-Reduces abnormalities of the neural tube such as anencephaly and spina bifida, reduces physical defects such as cleft lip and palate, urinary tract abnormalities and limb deformities, reduces risk of premature delivery and low birth weight
 - ❖ Vitamin & Calcium - prevent high blood pressure and premature births
 - ❖ Magnesium and Zinc - reduce risk of prenatal and birth complications
 - ❖ Fortify table salt to iodine based - eradicates infantile hypothyroidism (stunted growth & cognitive impairment)
 - ❖ Vitamin and Iron - Promote growth of placenta and healthy birth weight

3. EMOTIONAL STRESS

- ❖ Stimulant hormone is released
- ❖ Into the bloodstream
- ❖ Cause to action
- ❖ Large amount of blood are sent to parts of the body involved in the defensive response
- ❖ Blood flow to the other organs including uterus is reduced
- ❖ Result – fetus deprived of a full supply of oxygen and nutrients.
- ❖ Maternal stress hormones also cross the placenta can result fetal stress hormone

4. MATERNAL AGE

- ❖ Risk of infertility
- ❖ Miscarriage
- ❖ Babies born with chromosomal defects

CHILDBIRTH

A complex series of hormonal exchanges between mother and fetus initiates the process, which divides into three stages:

DILATION AND EFFACEMENT OF THE CERVIX

- Longest stage of labor (12-14 hrs)
- Contractions of uterus become more frequent and powerful
- Cause the uterine opening to widen
- Forming a clear channel from the uterus into the birth canal

DELIVERY OF THE BABY

- Lasting 50 minutes
- Strong contractions of the uterus continue
- Each contraction mother forces the baby down and out

BIRTH OF THE PLACENTA

Labor comes to an end with a few final contractions and pushes.

Placenta separate from the wall of the uterus

Delivered in 5 to 10 minutes

STAGES OF LABOR

First Stage- begins with the beginning of contractions that cause progressing changes in your cervix and ends when your cervix fully dilated

- Early Labor Phase
- Active Labor Phase
- Transition phase

Second stage- Continues after the cervix is dilated to 10 cm until the delivery of your baby, sometimes referred to as the “pushing stage”

Third Stage- Delivery of the placenta

FIRST STAGE

- **Early Labor (8-12 hours)**

- Once your contractions become relatively regular and your cervix begins to dilate, you are officially in early labor.
- Contractions will last about 30-45 seconds and give about 5-30 minutes of rest in between contractions
- Contractions may feel like aching in your lower back, menstrual cramps, and pressure on pelvis area
- Increase in mucousy vaginal discharge, which may be tainted with blood, the so called “Bloody show”
- Early labor is most likely to occur in the home.
- Possible for your water to break (amniotic sac rupture)
- **Internal Fetal Monitoring-** small clip placed on the mother’s stomach where the baby’s scalp is located to monitor the fetal heart rate
- Early labor ends when your cervix about 4cm dilated

- **Active Labor (4 to 8 hours)**

- Contractions are more frequent, longer, and strong, and no longer be able to talk through them
- Cervix dilates from 4 to 10 cm
- At the end, your baby begins to descend, or it will start to drop
- Contractions will last about 60 seconds, every 5 min, for an hour, when this happens it’s time to call the midwife or doctor

- **Transition (few min, to a few hours)**

- The last part of active labor, when your cervix dilates from 8 to a full 10 centimeters
- Contractions are usually very strong, coming every two and a half to three minutes or so and lasting a minute or more
- You may start shaking and shivering.

SECOND STAGE (PUSHING STAGE)

- ❖ This is when your cervix has been fully dilated, and it's time to push
- ❖ Lasts from 20 min -2 hours
- ❖ Contractions will last 45-90sec with a 3-5 minute rest period
- ❖ Your baby is very low in your pelvis so you will feel pressure on your rectum
- ❖ Your baby begins to descend with the force of each contraction of your uterus, and with your abdominal muscles helps move the baby through the birth canal. though all the effort your body is putting into the birthing process, only half is being exerted.
- ❖ Once your uterus is relaxed, the baby's body moves in a 2 step forward one step back kind of process

SECOND STAGE (THE BABY)

- ❖ Baby's head turns to the side and rests its chin on its chest so the back of the head can push through
- ❖ Baby shifts, to where it is facing your spinal cord.
- ❖ The baby will begin to "crown" or emerge from vaginal opening
- ❖ After the baby's head is out, its body begins to shift sideways allowing it to easily slip out

What will the baby look like?

- ✓ Cone shaped head
- ✓ Vernix coating- (cheese like substance that protects baby in uterus)
- ✓ Puffy eyes
- ✓ Lanugo (delicate hairs covering the baby, will shed at end of the first week)
- ✓ Enlarged genitals

THIRD STAGE (5-10 MIN)

- ❖ After giving birth uterus begins to contract
- ❖ These first contractions separate the placenta from uterine wall
- ❖ Care giver may ask you to push to help move out the placenta
- ❖ One small push and it comes out

Induced Labor

- ✓ If labor is delayed and not starting on its own, your practitioner can give you medication and other techniques to stimulate your contractions
- ✓ Sometimes waiting for labor to come naturally is more dangerous to the mother and child than inducing labor
- ✓ Pregnant 1-2 weeks after due date
- ✓ If baby gets to big
- ✓ If mother or child begins having medical issues
- ✓ When water breaks, and labor has not started yet
- ✓ Previously had a full term still birth
- ✓ Pitocin induction-it is given through a IV line and is used to cause contractions. usually, the amount is increased every 15-30 minutes until a good contraction pattern is achieved.
- ✓ Amniotomy (breaking the water)- the doctor sends a hook into the vaginal canal, to break the amniotic sac, this causes contractions to begin

Premature Labor

Occurs before the 37th week of pregnancy due to uterine contractions that cause the cervix to open earlier than normal

- Signs and Symptoms
 - ❖ Contractions every 10 min or more, often within one hour
 - ❖ Watery fluid leaving from your vagina (water broke)
 - ❖ Menstrual like cramp/ back aches
 - ❖ Pelvic pressure
 - ❖ Increase in Vaginal discharge/ bloody discharge
 - ❖ Please call health care provider immediately
 - ❖ After call, empty bladder, and lay on your left side and drink fluids this may slow down or stop signs and symptoms

BABY'S ADAPTATION TO LABOR AND DELIVERY

- ❖ Strong contractions expose the head to a great deal of pressure.
- ❖ Squeezing the placenta and the umbilical cord repeatedly.
- ❖ Each time baby's supply of oxygen is temporary reduced.
- ❖ Force of the contractions intensifies the baby's production of stress hormones
- ❖ Stress hormones arouse infants into alertness, ready to interact with their world.

NEWBORN BABY'S APPEARANCE

- Average newborn is 20 inches long
- Weighs 7 1/2 pounds
- Boys tend to be slightly longer and heavier
- Head is large than the trunk and legs
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ASSESSING NEWBORN'S PHYSICAL CONDITION: APGAR SCALE

		Score		
	SIGN	0	1	2
A – Appearance	Color	Blue body, arms, legs	Body pink with blue arms and legs	Body, arms, legs completely pink
P- pulse	Heart Rate	No heart-beat	Under 100 beats per minute	100 to 140 beats per minute
G- Grimace	Reflex irritability(sneezing, coughing, grimacing)	No response	Weak reflexive response	Strong reflexive response
A – Activity	Muscle Tone	Completely limp	Weak movements of arms and legs	Strong movements of arms and legs

R - Respiration	Respiratory Effort	No breathing for 60 seconds	Irregular, shallow breathing	Strong breathing and crying
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APPROACHES TO CHILDBIRTH

Childbirth practices, like other aspects of family life, are molded by the society of which mother and baby are a part. In many village and tribal cultures, expectant mothers are well acquainted with the childbirth process.

1. NATURAL OR PREPARED CHILDBIRTH

- Consists of group of techniques aimed at reducing pain and making childbirth as rewarding experience.
- Natural childbirth methods the expectant mother and a companion participate in 3 activities:
 - a. Classes: participate in classes and learn the anatomy and physiology of labor and delivery. Knowledge about the birth process reduces a mother's fear.
 - b. Relaxation and Breathing Techniques: Taught exercises aimed at counteracting the pain of uterine contractions
 - c. Labor Coach: Companion learns how to help during childbirth by reminding the mother to relax and breathe, massaging her back, supporting her body and offering encouragement and affection.
- Social support is important to the success of natural childbirth techniques.
- When natural childbirth is combined with delivery in a birth center or at home, mothers often give birth in an upright, sitting position rather than lying flat on their backs with their feet in stirrups.
- When mothers are upright, labor is shortened because contractions are stronger and pushing is more effective.
- The baby benefits from a richer supply of oxygen because blood flow to the placenta is increased.

2. INDUCED LABOR

- Is the one that is started artificially, usually by breaking of the amnion or bag of water and giving the mother synthetic oxytocin, a hormone that stimulates contractions. This is given as a drip through the vein in the mother's arm.
- It is justified when continuing the pregnancy threatens the well being of mother or baby and when the baby is very late.
- Contractions are longer, harder and closer together, increasing the possibility of inadequate oxygen supply to the baby.
- In addition, the mothers often find it more difficult to stay in control of an induced labor, even when they have been coached in natural childbirth techniques.

3. INSTRUMENTAL DELIVERY

- Forceps, metal clamps placed around the baby's head to pull the infant from the birth canal.
- A more recent instrument, the vacuum extractor, consist of a plastic cap (placed on the baby's head) attached to a suction tube.
- Instrument delivery is appropriate if mother's pushing during the second stage of labor does not move the baby through the birth canal in a reasonable period of time.
- Using forceps to pull the baby through most or all of the birth canal greatly increases the risk of brain damage.
- Vacuum extractors are less likely to tear the mother's tissues but the cup does cause bleeding beneath the baby's skin and external to the skull in about 6% of the cases

4. CAESAREAN DELIVERY

- A small incision made in the lower abdomen and uterus where the baby is delivered.
- It is carried out during medical emergencies, such as Rh incompatibility, premature separation of the placenta from the uterus, serious maternal illness or infection.
- It is justified when the babies are in breech position, turned so that the buttocks or feet would be delivered first.

- The breech position also increases the chances of squeezing the umbilical cord as the large head moves through the birth canal, thereby depriving the infant of oxygen.

5. LEBOYER METHOD

- ‘Gentle childbirth’ – reduces the pain and shock of delivery
- Soft music playing.
- Quite room that has low or dim lighting
- Minimize noise levels
- Not pulling on the baby’s head
- Baby placed on mom’s stomach after she or he is born
- Baby is gently massaged to ease crying
- Umbilical cord will not be cut until it has stopped pulsating
- Baby may be placed in warm tub of water

6. BIRTH IN WATER

- Water helps mom relax and softens the shock of deliver for mom.
- Mother sits in a warm tub of water, which supports her weight, relax her and provides her with the freedom to move into any position she finds most comfortable.
- Water birth is associated with reduced maternal stress, shorter labor and greater likelihood of medication- free delivery than both back lying and seated positions.

7. THE BRADLEY METHOD

- Sometimes also referred to as husband-coached natural childbirth.
- The idea that a woman could give birth without medication and only with her partner by her side to support her during labor
- Believed that the mother should put her baby to breast immediately after delivery to facilitate breastfeeding and mother-baby bonding—the mother is the ideal “baby warmer.”
- A mother who gives birth without complications should be able to go home within a few hours of delivery.

8. **CROUCHING METHOD** – squatting down and letting gravity help deliver the baby. Less chance of tearing, used in more primitive societies.

LABOR AND DELIVERY MEDICATION

- EPIDURAL - A type of block used to deaden pain during labor and delivery mom can still push and participate in the labor
- ANALGESIS – Drugs used to relieve pain in mild doses
- ANESTHETICS - Stronger type of painkiller that blocks the sensation

BIRTH COMPLICATIONS

OXYGEN DEPRIVATION/ANOXIA

- Failure to breathe within few minutes. Healthy newborns can survive periods of little or no oxygen longer than adults can; they reduce their metabolic rate, thereby conserving the limited oxygen available.
- Brain damage is likely if regular breathing is delayed more than 10 minutes.
- **During Labor**
 - i. Squeezing of the umbilical cord – a condition that is especially likely when infants are in breech position.
 - ii. Placenta abruptio/premature separation of the placenta
- Rh Factor incompatibility between mother's and baby's blood types
 - i. When mother is Rh –ve (lacks the Rh protein) and father is Rh +ve (has Rh protein) the baby may inherit father's Rh +ve blood type.
 - ii. Even if little of fetus's Rh +ve blood crosses the placenta into the Rh –ve mother's bloodstream, she begins to form antibodies to the foreign protein.
 - iii. If these enters fetus's system, they destroy red blood cells, reducing the supply of oxygen.
 - iv. Intellectual disability, miscarriage, heart damage and infant death can occur.
 - v. It takes time for the mother to produce antibodies, so firstborn children are rarely affected.
 - vi. The danger increases with each pregnancy.
 - vii. Rh incompatibility can be prevented in most cases. After the birth of each Rh – positive baby, Rh – negative mothers are given a vaccine to prevent the build-up of antibodies.
- After initial brain injury from anoxia, another phase of cell death can occur several hours later. Placing anoxic newborns in a head-cooling device shortly after birth for 72 hours substantially reduces this secondary brain damage and increases scores on a new-born behavioural assessment.

PRETERM AND LOW-BIRTH WEIGHT INFANTS

- Babies born three weeks or more before the end of a full 38 – week pregnancy or who weigh less than 2,500 grams referred to as “prema-
ture”.
- Brain abnormalities, frequent illness, inattention, overactivity, sensory impairments, poor motor coordination, language delays, low intelligence test scores are some of the difficulties that persist through childhood and adolescence and into adulthood.
- **Preterm versus Small – for – Date Infants**
 - a. Preterm - Those born several weeks or more before their due date.
 - b. Small for date infants - Are below their expected weight considering length of the pregnancy. During the first year, they are more likely to die, catch infections, evidence of brain damage. By middle childhood- smaller stature, lower intelligence test scores, less attentive, socially immature.
 - c. Small for date infants probably experienced inadequate nutrition before birth. Perhaps their mothers did not eat properly, the placenta did not function normally.
- **Consequences for Caregiving**
 - a. The appearance and behaviour of preterm babies can lead parents to be less sensitive and responsive in caring for them.
 - b. Preterm babies especially those who are very ill at birth are less often held close, touched and talked to gently.
 - c. Research reveals that distressed, emotionally reactive preterm infants are especially susceptible to the effects of parenting quality: among a sample of preterm 9 – month olds, the combination of infant negativity and angry or intrusive parenting yielded the highest rates of behaviour problems at 2 years of age. But with warm, sensitive parenting, distressed preterm babies rates of behaviour problems were the lowest. (Poehlmann et. Al., 2011). When preterm babies are born to isolated, poverty stricken mothers who cannot provide good nutrition, health care and parenting, the likelihood of unfavourable outcomes escalates. In contrast, parents with stable life circumstances and social support usually can overcome the stresses of caring for a preterm infant. (Ment et al., 2003). These findings indicate that how well preterm infants fare has a great deal to do with the parent- child relationship.

- **Interventions for Preterm Infants**

- a. Plexiglas-enclosed bed – ISOLETTE : Temperature is carefully controlled. Air is filtered before it enters isolette.

- b. Special infant stimulation**

- i. Intensive care nurseries, preterm babies can be seen rocking in suspended hammocks or lying on water beds designed to replace the gentle motion they would have received while still in the mother's uterus.
 - ii. An attractive mobile or a tape recording of a heartbeat, soft music, mother's voice.
 - iii. Touch – releases certain brain chemicals
 - iv. Kangaroo care – placing the infant in a vertical position between mother's breast or father's chest

These special stimulation supports in gained weight faster, motor development. The kangaroo care position provides the baby with gentle stimulation of all sensory modalities: hearing, smell, touch, visual.

- c. Training – interventions that support parents of preterm infants generally teach them about the infant's characteristics and promote caregiving skills.