

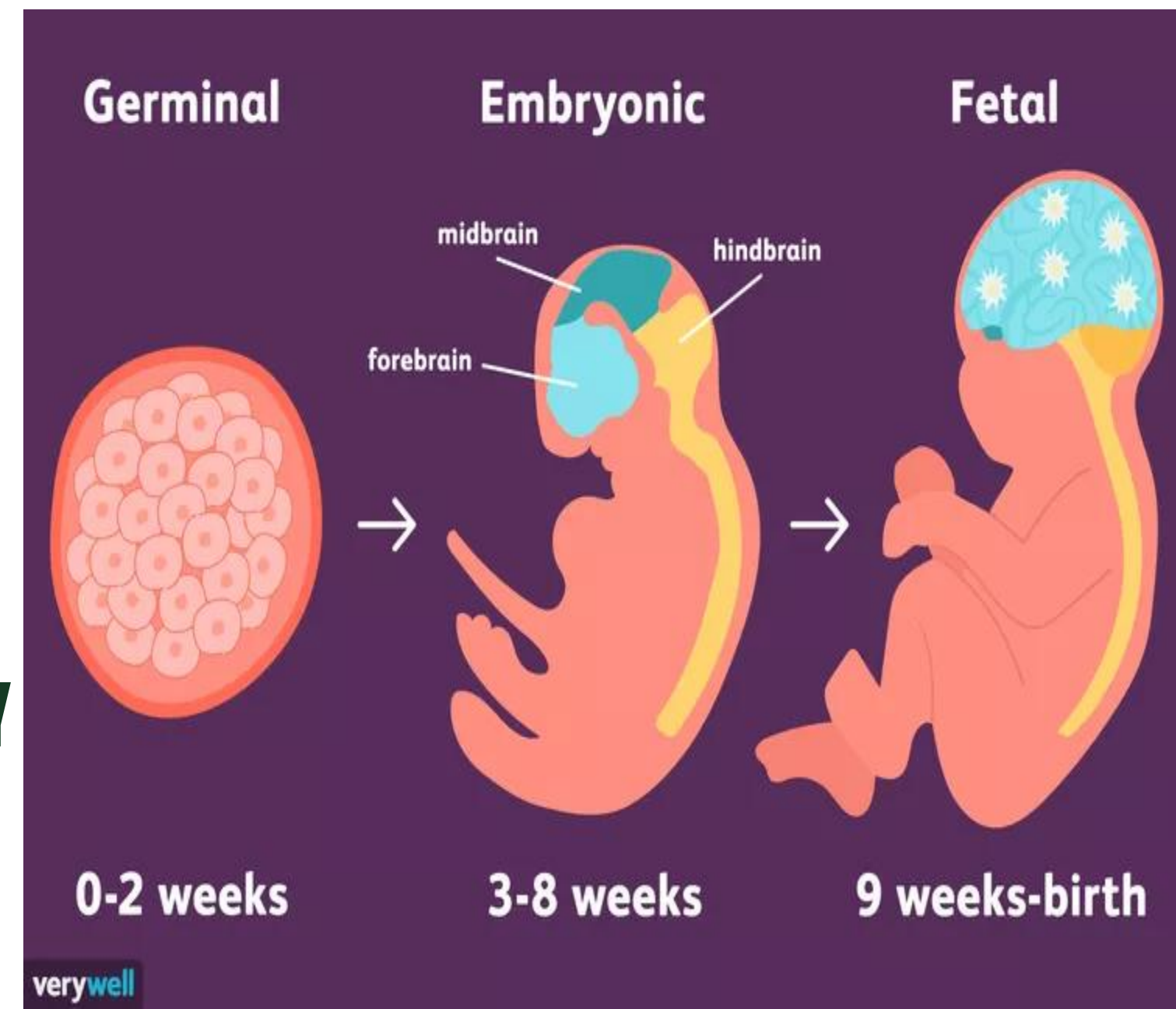
PSY105 DEVELOPMENTAL PSYCHOLOGY



PSY105 DEVPSYCH

MODULE 2: BEGINNING OF LIFE

PRENATAL PERIOD AND THE CULTURAL BELIEFS ABOUT PREGNANCY



Have you asked your parent/s about what they remember from around the time you were conceived? If yes, are you comfortable sharing it now?

Forming a New Life

- Conception – occurs when a single sperm cell from the male unites with an ovum (egg) in the female's fallopian tube in a process called fertilization



Course of Prenatal Development

- Typical prenatal development begins with fertilization and ends with birth, lasting between 266 and 280 days (from 38 to 40 weeks). It can be divided into three periods: germinal, embryonic, and fetal
- Cephalocaudal principle- from latin, meaning “head to tail,” from head to lower part of the trunk
- Proximodistal principle - from latin, meaning “near to far” from center of the body to outer ones

Germinal Period

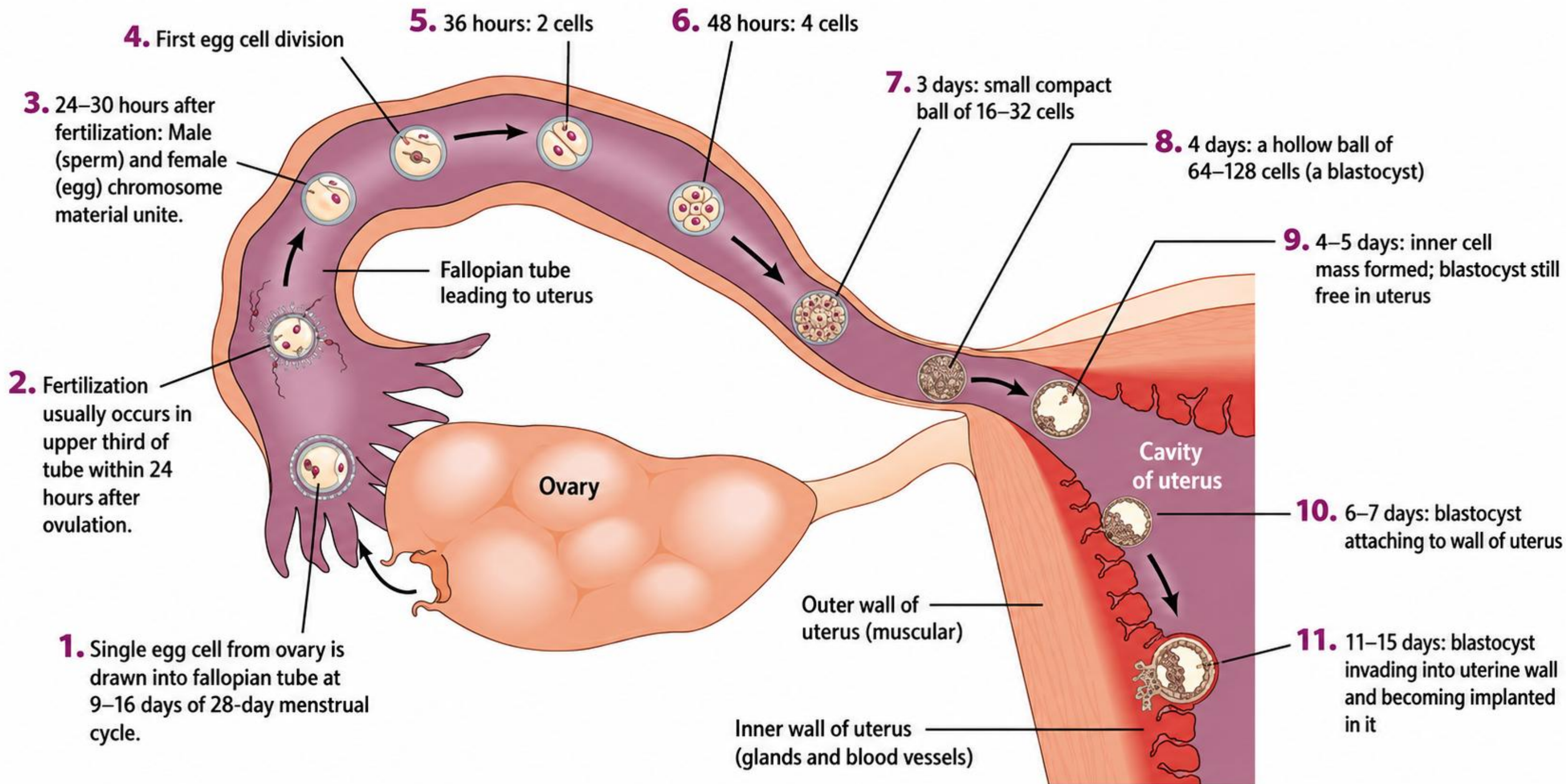
- Germinal Period – Is the period of prenatal development that takes place in the first two weeks after conception.
- It includes the creation of the fertilized egg, called a zygote, cell division, and the attachment of the zygote to the uterine wall
- Rapid cell division (mitosis) by the zygote continues throughout the germinal period
- By approximately one week after conception, the differentiation of these cells-their specialization for different tasks-has already begun.
 - At this stage, the group of cells, now called the blastocyst, consists of an inner mass of cells that will eventually develop into the embryo
 - Trophoblast – an outer layer of cells that later provides nutrition and support for the embryo

Germinal Period

- Implantation - attachment of the zygote to the uterine wall , takes place about 11 to 15 days after conception.
- Before implantation, as cell differentiation begins, some cells around the edge of the blastocyst cluster on one side to form the embryonic disk, a thickened cell mass from which the embryo begins to develop.
 - Ectoderm – the upper layer, will become the outer layer of skin, the nails, hair, teeth, sensory organs, and the nervous system, including the brain and spinal chord
 - Endoderm - the inner layer, will become the digestive system, liver, pancreas, salivary glands, and respiratory system
 - Mesoderm – the middle layer, will develop and differentiate into the layer of skin, muscles, skeleton, and excretory and circulatory systems.

Germinal Period

- Other parts of the blastocyst begin to develop into organs that will nurture and protect development in the womb:
 - Amniotic sac is a fluid-filled membrane that encases the developing embryo, protecting it and giving it room to move and grow.
 - Placenta allows oxygen, nourishment, and wastes to pass between mother and embryo.
 - Umbilical Cord – Nutrients from the mother pass from her blood to the embryonic blood vessels, which carry them, via the umbilical cord, to the embryo



Embryonic Stage – 2-8 weeks

- Embryonic Stage – the organs and major body systems-respiratory, digestive, and nervous-develop rapidly (**Organogenesis**)
 - This is a critical period, when the embryo is most vulnerable to destructive influences in the prenatal environment
- The most severely defective embryos usually do not survive beyond the first trimester, or 3-month period, of pregnancy
- Spontaneous abortion, commonly called a miscarriage, is the expulsion from the uterus of an embryo or fetus that is unable to survive outside the womb
- A miscarriage that occurs after 20 weeks of gestation is generally characterized as a stillbirth

Fetal Stage (8 weeks to Birth)

- The appearance of the first bone cells at about 8 weeks signals the beginning of the fetal stage
- The fetus grows rapidly to about 20 times its previous length, and organs and body systems become more complex
- Fetuses are not passive passengers in their mothers' wombs. They breathe, kick, turn, flex their bodies, do somersaults, squint, swallow, make fists, hiccup, and suck their thumbs
- It is highly unlikely that they feel pain before 3rd trimester as the cortex of the brain are immature at this point

FIRST TRIMESTER (FIRST 3 MONTHS)

CONCEPTION TO 4 WEEKS



- Is less than 1/10 inch long
- Beginning development of spinal cord, nervous system, gastrointestinal system, heart, and lungs
- Amniotic sac envelopes the preliminary tissues of entire body
- Is called a "zygote"

8 WEEKS



- Is just over 1 inch long
- Face is forming with rudimentary eyes, ears, mouth, and tooth buds
- Arms and legs are moving
- Brain is forming
- Fetal heartbeat is detectable with ultrasound
- Is called an "embryo"

12 WEEKS



- Is about 3 inches long and weighs about 1 ounce
- Can move arms, legs, fingers, and toes
- Fingerprints are present
- Can smile, frown, suck, and swallow
- Sex is distinguishable
- Can urinate
- Is called a "fetus"

SECOND TRIMESTER (MIDDLE 3 MONTHS)

16 WEEKS



- Is about 6 inches long and weighs about 4 to 7 ounces
- Heartbeat is strong
- Skin is thin, transparent
- Downy hair (lanugo) covers body
- Fingernails and toenails are forming
- Has coordinated movements; is able to roll over in amniotic fluid

20 WEEKS



- Is about 12 inches long and weighs close to 1 pound
- Heartbeat is audible with ordinary stethoscope
- Sucks thumb
- Hiccups
- Hair, eyelashes, eyebrows are present

24 WEEKS



- Is about 14 inches long and weighs 1 to 1½ pounds
- Skin is wrinkled and covered with protective coating (vernix caseosa)
- Eyes are open
- Waste matter is collected in bowel
- Has strong grip

THIRD TRIMESTER (LAST 3 MONTHS)

28 WEEKS



- Is about 16 inches long and weighs about 3 pounds
- Is adding body fat
- Is very active
- Rudimentary breathing movements are present

32 WEEKS



- Is 16½ to 18 inches long and weighs 4 to 5 pounds
- Has periods of sleep and wakefulness
- Responds to sounds
- May assume the birth position
- Bones of head are soft and flexible
- Iron is being stored in liver

36 TO 38 WEEKS



- Is 19 to 20 inches long and weighs 6 to 7½ pounds
- Skin is less wrinkled
- Vernix caseosa is thick
- Lanugo is mostly gone
- Is less active
- Is gaining immunities from mother

Prenatal Hazards

Environmental Factors: Maternal and Paternal

Teratogens

- A teratogen is an environment agent, such as a virus, a drug, or radiation, that can interfere with normal prenatal development
 - From the Greek word tera, meaning “monster”
 - Not all environmental hazards are equally risky for all fetuses.
 - The timing of exposure, dose, duration, and interaction with other teratogenic factors also may make a difference

Degree of sensitivity

FIGURE 8

When Birth Defects Occur

Body parts and systems are most vulnerable during organogenesis, when they are developing most rapidly, generally within the first trimester of pregnancy.

Period of dividing zygote, implantation, and embryo, weeks

Embryonic period, weeks

Fetal period, weeks

Full term

1

2

3

4

5

6

7

8

9

10

11

16

20-36

38

Usually not susceptible to teratogens



Zygote

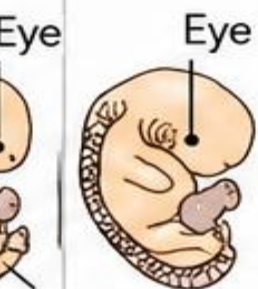
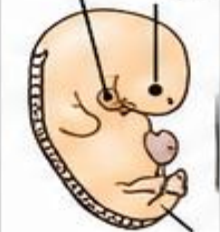


Implanted blastocyst

Central nervous system
Heart



Heart
Eye



Limbs

Common site of action of teratogen

Ear



Teeth

Palate



Ear



External genitalia

Brain



Greatest sensitivity to teratogens



Less sensitivity to teratogens, although still potentially significant

Central nervous system

Heart

Ears

Eyes

Arms

Legs

Teeth

Palate

External genitalia

Note: Intervals of time are not all equal.

Source: Brody, 1995; data from March of Dimes.

Maternal Factors

- Nutrition and Maternal Weight
 - Pregnant women typically need 300 to 500 additional calories a day, including extra protein
 - Women of normal weight and body build who gain 16 to 40 pounds are less likely to have birth complications
 - Women who are overweight or obese before becoming pregnant or in the early months of pregnancy tend to have a number of different pregnancy complications.

Maternal Factors

- Malnutrition
 - Babies born to mothers who do not consume sufficient calories have a higher risk of death, and surviving babies may be stunted, an effect that can persist across generations
 - Vitamin A and zinc deficiencies result in a higher risk of death for both child and mother and babies born to mothers with a vitamin D deficiency ,may suffer from weak and soft bones
 - Fetal undernutrition has also been associated with a number of increased risks for disease in adulthood

Maternal Factors

- Physical Activity and Work – Moderate exercise any time during pregnancy does not seem to endanger the fetuses of healthy women
- However, strenuous working conditions, occupational fatigue, and long working hours may be associated with a greater risk of premature birth

Maternal Factors- Drug Intake

- Medical drugs – a tranquilizer called thalidomide was banned after it was found to have caused stunted or missing limbs, severe facial deformities, and defective organs in some 12, 000 babies
- Opioids - While opioid use has not been implicated in birth defects, it is associated with small babies, fetal death, preterm labor, and aspiration of meconium.
 - babies born to drug- addicted mothers are often addicted themselves and go through withdrawal once they are born and longer receiving the drug.

Maternal Factors- Drug Intake

- Alcohol-Prenatal alcohol exposure is the most common cause of intellectual disability and the leading preventable cause of birth defects in the U.S.
- Fetal Alcohol Syndrome (FAS) is characterized by a combination of retarded growth, face and body malformations, and disorders of the central nervous system
 - In Infancy, reduced responsiveness to stimuli, slow reaction time, and reduced visual acuity (sharpness of vision)
 - throughout childhood, short attention span, distractibility, restlessness, hyperactivity, learning disabilities, memory deficits, and mood disorders as well as aggressiveness and problem behavior.

Maternal Factors- Drug Intake

- Nicotine - Maternal smoking during pregnancy has been identified as the single most important factor in low birth weight in developed countries
- Tobacco use during pregnancy also brings increased risks of miscarriage; growth retardation; stillbirth; small head circumference; sudden infant death; colic (uncontrollable, extended crying for no apparent reason) in early infancy; long-term respiratory, neurological, and behavioral problems; and later obesity and cardiovascular disease

Maternal Factors- Drug Intake

- Marijuana- exposure during pregnancy is not associated with birth defects and it does not appear to be consistently associated with any particular pattern of cognitive or behavioral outcomes in early infancy, although some infants may show minor signs of irritability or altered sleeping patterns
- Cocaine – has been associated with spontaneous abortion, delayed growth, premature labor, low birth weight, small head size, birth defects, and impaired neurological development.

