Prenatal Development

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Prenatal refers to the period of time between conception and birth. As such, prenatal development is the process in which a fetus develops in its mother's womb. This period typically lasts nine months. Prenatal development can be divided into three stages: the germinal stage, the embryonic stage, and the fetal stage (Lally & Valentine-French, 2019).

The germinal stage occurs during the first two weeks of pregnancy (Lally & Valentine-French, 2019). This stage begins at conception, when a female egg is fertilized by a male sperm. The fertilized egg creates a zygote, which is made up of half of the chromosomes from the egg, and half from the sperm. The zygote then travels down to the uterus, a process which can take up to one week. While the zygote is traveling to the uterus, the zygote cells begin to divide, until thousands of cells are created. When the zygote reaches the uterus, it attaches to the uterine wall and becomes an embryo. This process is known as implantation (Lally & Valentine-French, 2019).

The embryonic stage occurs for the next six weeks (Lally & Valentine-French, 2019). Many of the embryo's organs begin to develop during this period. The neural tube is formed, which creates the basic structures of the spinal cord, brain, and peripheral nervous system. Other body parts, including the eyes, nose, ears, mouth, arms and legs also form during this period. Structures to protect the embryo and help it grow are also formed, including the amniotic sac, the placenta, and the umbilical cord. It is during this period that the embryo becomes distinguishable as human (Lally & Valentine-French, 2019). It is also during this period that the embryo is most vulnerable to harm, as it is when the major structures of the body are beginning to take form.

The final stage is the fetal stage. During this stage the embryo is known as a fetus, and the stage lasts from the ninth week to birth (Lally & Valentine-French, 2019). The basic organs and bodily structures that developed during the embryotic stage continue to grow and become more complex during the fetal stage. During the third month of pregnancy (weeks 9-12), the fetus has all of its body parts, except for genitalia. By the end of the third month, also known as the first trimester, the fetus' sex organs are developed. During the next three months, or the second trimester, the fetus grows rapidly, develops hair, nails, and eyelashes, and is able to distinguish tastes and develop preferences for tastes and sounds (Lally & Valentine-French, 2019; Cleveland Clinic, 2014). During the last three months, or third trimester, the brain and other organs continue to develop, and the fetus continues to grow in size and weight to prepare for birth.

There are many factors that may affect normal prenatal development. Teratogens are substances that may harm an embryo or fetus. Teratogens include drugs, alcohol, and environmental factors such as radiation exposure or pollution (Lally & Valentine-French, 2019). Teratogens are most harmful during the early stages of prenatal development, and when exposure to the teratogen is large and repeated. Common teratogens are cigarette smoking and alcohol consumption. Cigarette smoking during pregnancy has been associated with a number of birth complications, including preterm birth and low birth weight, both of which can cause physical and motor abnormalities, as well as behavioral and cognitive issues (Lally & Valentine-French, 2019). Alcohol consumption during pregnancy may result in fetal alcohol syndrome, a disorder characterized by facial, bodily and genital abnormalities, intellectual disabilities, delayed physical, social, and language development, and problems with vision and/or hearing (Lally & Valentine-French, 2019).

Another factor that may impact fetal development include maternal poverty. Mothers living in poverty are more likely to be malnourished, experience stress, and more likely to be a single (Larsen, 2007). They are also less likely to receive proper prenatal care, including prenatal vitamins. These factors not only affect prenatal development, but may also cause long-term adverse outcomes. For example, poverty has been associated with delayed cognitive development, behavior problems, and poor academic achievement in children (Larsen, 2007; Duncun & Brooks-Gunn, 2000). Risk for grade repetition has been found to be two times higher in children living in poverty as compared to children who do not (Duncun & Brooks-Gunn, 2000). Additionally, children living in poverty were also 1.4 times more likely to have learning disabilities and 1.3 times more likely to have emotional or behavioral problems as compared to children not living in poverty (Duncun & Brooks-Gunn, 2000). Overall, these various substances and socioeconomic factors may not only impact prenatal development but may also have long-term effects on a child's development and life.

Further Readings:

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