Human Development

What Happens Before Birth?

Prenatal Development
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prē nāt”l
adjective
before birth or during pregnancy
Genetic Influences
(click on link)
Genetics

Nucleus of the cell
– Chromosomes
  • store and transmit genetic information
  • Come in 23 matching pairs, one from mother and one from father
  • Made up of DNA (deoxyribonucleic acid)
  • Gene is a segment of DNA along the chromosome
Genetics

Sex cells

– Special cells called gametes (sperm and ovum)
– Each contain only 23 chromosomes, half as many as a regular body cell
– Cell that results is called a zygote, having 23 pair (or 46) chromosomes
Genetics

Mitosis

- Process for DNA replication
- Allows a single cell, formed at conception, to develop into a human being with many cells
- Each cell contains identical DNA; identical genetic information
Prenatal Development
(click on link)
Stages of Prenatal Development

Conception

– Fertile periods about once every 28 days, in the middle of the menstrual cycle
– Ovum discharged and possibly fertilized by sperm
– Sperm can live up to six days
Stages of Prenatal Development

Germinal period of the zygote

- Lasts about two weeks
- Period between fertilization and the time that the mass of cells attach to the wall of the uterus
- Implantation
- Placenta and umbilical cord
Stages of Prenatal Development

Period of the embryo

– Implantation to eight weeks
– Most rapid prenatal changes take place
– All parts of the body are forming
Stages of Prenatal Development

Period of the fetus

– From the ninth week until the end of pregnancy
– Third month
  • Organs, muscles, and nervous system continue to develop
  • Fetus kicks, curls its toes, and can even suck its thumb
  • End of the first trimester
Stages of Prenatal Development

• Period of the fetus
• Second trimester
  – By the end of this trimester, most of the brain’s billions of neurons are in place
  – Can be stimulated by sounds
  – Sense of sight is developing
  – Still cannot survive on its own outside the womb
Stages of Prenatal Development

• Period of the fetus
• Third trimester
  – First chance for survival outside the womb
  – Lungs are not yet finished until very near the end of the trimester
  – Brain continues with great development
  – Activity increases
Healthy Nutrition During Pregnancy
(click on link)
Prenatal Nutrition

Prenatally, children are totally dependent on Mom for nutrition

– Requires gradual increase in calories for Mom
– Expected weight gain of 25 to 30 pounds
Prenatal Malnutrition

– Serious damage to central nervous system
– Loss of some brain weight for the baby; not reaching its full potential
– Distorted organ structure, impacting liver, kidney, and pancreas (lifelong health problems)
Prenatal Malnutrition

Suppresses development of the immune system

• Babies often have respiratory problems
Prenatal Malnutrition

– Can cause babies to be irritable, with a high pitched cry similar to drug-addicted newborns
– Can cause babies to be unresponsive to stimulation
Prenatal Malnutrition

– As they age, these children exhibit low intelligence test scores

– Children often have serious learning problems
What to Do?

Good eating habits and a well-balanced diet can help ensure a healthy baby.
What to Do?

Vitamin-mineral enrichment is necessary

– Folic acid helps prevent – abnormalities of neural tube; premature birth
– Calcium helps prevent – maternal high blood pressure; premature birth
– Iodized salt prevents – cretinism (stunted growth and mental retardation)
Healthy Women Healthy Families: Prenatal Health
(click on link)
Medical Care

Is needed throughout the entire pregnancy

– In U.S., 16% expectant mothers wait until the second trimester to seek medical care.

– Babies are three times more likely to have low birth weight; five times more likely to die.
Good Health Practices

Pregnant women should

– See a doctor as soon as they suspect they are pregnant and get regular medical checkups
– Ask questions of their health care provider
– Eat a well-balanced diet; take prescribed vitamins
– Continue to exercise, with medical permission
– Get adequate rest
Good Health Practices

Pregnant women should **not**

- Smoke
- Drink alcohol in any amount
- Take any drugs without consulting the doctor
- Go on a diet without medical advice
- Engage in activities that could expose them to harmful infectious diseases
Healthy Preventing Birth Defects
- Health Matters
(click on link)
Environmental Factors

There are sensitive periods in prenatal development during which a particular organ or structure may be impacted.

(See chart on next slide)
Fetal Damage due to Toxins

[Diagram showing the stages of fetal development and the timing of adverse effects from toxins.]
Environmental Factors

Teratogens

– Any environmental agent that causes damage during the prenatal period
  • Drugs, prescription and non-prescription
  • Illegal drugs
  • Tobacco
  • Alcohol:
Environmental Factors

Teratogens

– Any environmental agent that causes damage during the prenatal period

• Radiation
• Pollution
• Disease
References and Resources

• Microsoft Clip Art: Used with permission from Microsoft.

Textbook:

References and Resources

YouTube™:

• Genetic Influences
  http://www.youtube.com/watch?v=7FWPqPrwsCk

• Healthy Nutrition during Pregnancy
  http://www.youtube.com/watch?v=oq5sIPdDm5U

• Healthy Women Healthy Families – Prenatal Health. University of California TV.
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• Healthy Women Healthy Families – Preconception Health
  University of California TV.
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• Preventing Birth Defects – Health matters
  University of California TV
  http://www.youtube.com/watch?v=qYoNkWM8QxE

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  http://www.youtube.com/watch?v=mOVtp9cdQVM
References and Resources

Websites:


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