Hazards to Prenatal Development: Teratogens

- **Teratogens** are any agents from the environment that can cause harm to the developing fetus.
- Many harmful agents cause damage only if exposure occurs during a **sensitive period** of prenatal development.
- Critical factors that influence the degree of harm a teratogen will cause:
  - The **amount** and **length** of exposure
  - Individual differences in **susceptibility**

- The impact of a teratogen depends on the genotype of the organism. (e.g. thalidomide, alcohol)
- The impact of teratogens changes the course of prenatal development.
- Each teratogen affects a specific aspect (or aspects) of prenatal development. (e.g. PCBs)
- Impact of teratogens depends on the dosage.
- Damage from teratogens is not always evident at birth but may appear later in life. (e.g. DES)
- Impact of teratogens often depends on quality of postnatal environment
Hazards to Prenatal Development: Miscarriage

- About 45% or more pregnancies end in miscarriage, that is, spontaneous abortion.
- Most miscarried fetuses have severe defects, such as missing chromosomes, that make further development impossible.
- Ninety percent of fetuses that survive the danger of miscarriage are born normal.

Risk Factors

- Age
- Nutrition
- Exercise
- Stress
Risk Factors

• Age
  – Pregnancy most likely to result in a healthy baby if mother is in her 20’s.
  – Older mothers have increased risk of miscarriage and stillbirth and are more liable to give birth to Down syndrome children.
  – Younger mother are at greater risk for inadequate diets and prenatal care and are more likely to have children with behavioral problems.

• Nutrition
  – Malnourished newborns have smaller brain cells and are more vulnerable to illnesses than well-nourished newborns.
  – Malnutrition in early prenatal development may lead to serious physical defects (e.g. folic acid)
  – Malnutrition in the last few months may lead to low birth weight and small heads.
Risk Factors

• Age
• Nutrition
• Exercise
  – Regular, moderate exercise is related to increased birth weight.
  – Frequent, vigorous exercise predicts lower birth weight.

Risk Factors

• Age
• Nutrition
• Exercise
• Stress
  – In animals, stress results in smaller offspring prone to behavioral problems.
  – In humans, extreme maternal stress may be related to lower birth weight and children with emotional problems and behavioral disorders.
The case of low birth weight

- Low birth weight is associated with:
  - Caffeine, smoking, marijuana
  - Stress, inadequate nutrition
  - Premature birth
  - “difficult” temperament
  - Lagging cognitive development
  - Unstable families
  - Lagging social development
  - Behavioral problems

Which are causes?
Which are consequences?