**Environmental Etiology**
- Teratogen - substance or condition that causes birth defect
- direct or indirect action of agent external to genetic material of fetus
- effect of teratogen mediated by genotype of mom and child
- timing and amount of exposure influence effect

**Critical Periods of Teratogens**
- most vulnerable: periods of rapid differentiation
  - 1st 2 weeks
    - not sensitive for specific defect
    - highly lethal
  - 14-60 days
    - most sensitive: organogentic period
    - teratogens produce malformations

**Organ Vulnerability**
- during 3-8 weeks, each organ has specific vulnerability
  - prepalatal cleft: 5-8 weeks
  - palatal cleft: 6 -10 weeks
  - ear - 4-12 weeks

**Teratogen: Drugs**
- Alkaloids - caffeine and nicotine
- Tranquilizers: Valium/thalidomide
- Steroids
- amphetamines
- seizure meds (hydantoin and trimethadione)
- antibiotics
- tumor inhibiting drugs
- alcohol, LSD, marijuana

**Teratogen: Infectious Disease**
- Rubella: cataracts, deafness and cardiac malformations
  - 15-20% of infants exposed
- Toxoplasmosis
- CMVL (cytomegalovirus)

**Teratogen: Radiation**
- anomalies of CNS, eye and mental retardation