

*Tuesday, March 1, 8:00AM-12:00PM
Plenary Session*

Teratogen Update

Moderator: Angela Lin, MassGeneral Hospital for Children, and the Massachusetts Birth Defects Monitoring Program, DPH, Boston, MA

Fetal Development as Vulnerable Periods

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The most critical (vulnerable) period for the induction of a birth defect in an embryo is from the 3rd to the 8th weeks of gestation (post-fertilization). This is the most sensitive period because each organ system develops during this time frame and organ systems are most vulnerable in their primordial stages. Once an organ system has become established, it becomes more and more resistant to a teratogenic insult. Thus the “fetal period” from the 9th week until birth is not as vulnerable to an insult and structural birth defects do not occur with great frequency during this time period. However, some systems, like the brain remain vulnerable throughout gestation and even after birth, such that no time is “safe.”

Just as the embryo is sensitive to a birth defect causing insult during this early time frame, each organ system goes through sensitive and less sensitive periods in its development. These sensitive periods may last only a couple of days or a week depending on the organ. Organs are most sensitive when they first start to form at their primordial stages. At this time, cells forming the organ are rapidly dividing, a particularly sensitive time, and then as they begin to slow their proliferation rates and to differentiate, they become more resistant to a teratogenic insult. Because several organs may be vulnerable at the same time, a single teratogen or a single gene abnormality may cause defects in multiple systems simultaneously. Since all of the critical periods for organ formation occur so early in gestation, strategies to prevent birth defects must be instituted prior to conception.