

Environmental Teratogens and Neurobehavioral Disorders in Persons with Developmental Disabilities

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A teratogen is a substance that can cause harm to a developing baby during pregnancy.

The US Environmental Protection Agency (EPA) has identified the following developmental neurobehavioral teratogens for humans: lead, PCBs (polychlorinated biphenyls), methyl mercury, cocaine, alcohol, tobacco, phenytoin (seizure medication), heroin, methadone, and ionizing radiation.

Neurobehavioral disorders that could be caused by teratogens include: attention deficits, hyperactivity, memory deficits, conduct disorder, sensory integration disorder,

According to the Institute of Health 1996 Report to Congress, the neurological symptoms that are known to be caused by teratogens are as follows:

	Alcohol	Mercury	Radiation	Phenytoin	PCBs	Lead	Heroin	Marijuana	Tobacco	Cocaine
Gross brain damage	X	X	X							
Subnormal IQ	X	X	X	?	?					
Developmental delays	X	X		X	X			X	X	
Sensory deficits	X	X				X			X	
Fine motor deficits	X				X	?				
Attention deficits	X					?		X	X	
Hyperactivity	X				X	?			X	
Gait abnormality	X	X								
Neonatal withdrawal	X						X	?	X	X
Prematurity	X									X

The Institute of Medicine report noted no neurological effects caused by cocaine, heroin, or methadone, except for possible withdrawal symptoms for a short time after birth. As such they are no longer considered teratogens. The Institute of Medicine report offers the following explanation: “Although reports from the mid 1980s suggested that the use of cocaine during pregnancy increased the risk of genitourinary tract malformations, abruptio placenta, intrauterine growth retardation, sudden infant death syndrome as well as a number of postnatal neurobehavioral deficits, subsequent reports largely failed to replicate these initial observations. A major problem in interpreting the results of virtually all of the studies that reported these adverse effects is the extent to which the outcomes attributed to cocaine resulted from concurrent abuse of alcohol, cigarettes, and other illicit substances.” The effects of heroin and methadone on the fetal brain “appear to be mediated by the opioid receptors.” The report did not include toluene exposure, which can result in symptoms similar to those seen with alcohol exposure.

Neurobehavioral disorders in children exposed to lead is believed by researchers to be caused as much by preconceptual and postnatal exposure as by exposure in utero. Children with prenatal exposure to lead have some symptoms during the first two years, but appear to have no significant developmental delays by the time they are five years old (Bellinger D, Dietrich KN. Low-level lead exposure and cognitive function in children. *Pediatr Ann.* 1994;23:600–605).

For more information on prevention and treatment of Fetal Alcohol Spectrum Disorders, visit the FAS Community Resource Center: <http://fasstar.com/fas>.