

**OCCUPATIONAL REPRODUCTIVE
CHEMICAL STRESSORS LIST***

<u>Stressor</u>	<u>Notes</u>
α-Naphthyl-N-methyl carbamate	(See Carbaryl)
Acetaldehyde	Primary metabolite of ethanol
Alcohol	(See Ethanol)
Arsenic	<p>Pregnancy: Occupational exposure to inhaled inorganic arsenic associated with increased incidence of congenital malformations and decreased birth weight</p> <p>Ingested inorganic arsenic has been reported in association with premature delivery and subsequent neonatal death</p> <p>Placental toxicity: Appears in cord blood in almost same levels as maternal</p> <p>Breastfeeding: Low concentrations in breast milk</p>
Benzene	Pregnancy: Spontaneous abortion, premature births, neonatal complications
Benzimidazoles	(See Carbendazim)
Bischloroethyl nitroso urea	<p>Category A</p> <p>Breastfeeding: Contraindicated</p>
1,3-Butadiene	<p>No human data.</p> <p>Animal data (inhalation exposure)</p> <p>Male: Increased incidence of spermhead abnormalities and testicular atrophy (mice)</p> <p>Female: Increased incidence of ovarian atrophy (mice)</p>
Butiphos	Pregnancy: Malformations, stillbirths, and difficult deliveries from occupational contact (one report)
Cadmium	<p>Males (inhalation exposure): No consistent effect. OSHA notes an increased risk of prostate cancer</p> <p>Pregnancy: Decreased birth weight (with inhalation exposure). Placental toxicity associated with preterm</p> <p>Breastfeeding: No reported effect</p>

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Carbarsone	Category A (contains 29% Arsenic)
Carbaryl	Males: Abnormal sperm shape Development: No human developmental data, teratogenic in several animal species
Carbendazim	Human data lacking, but reproductive /developmental effects are noted in several animal species: Male (rat): Testicular/sperm toxicity Embryotoxic Teratogenic
Carbon disulfide	Male: Spermatotoxic, decreased libido, impotence Female: Menstrual irregularities, decreased fertility, increased spontaneous abortion Pregnancy: 4 ppm (10 mg/m ³) recommended as occupational exposure limit during pregnancy, birth defects reported, children's intelligence hindered significantly when one or both of their parents were exposed to carbon disulfide at levels greater than 10 mg/m ³ (3 to 4 ppm), in addition to birth defects Breastfeeding: Can cross the placental barrier and be secreted into mothers' milk
Carbon monoxide	Pregnancy (fetal hemoglobin binds O ₂ more avidly than adult hemoglobin): Low birth weight CNS abnormalities reported, hyperbaric O ₂ not contraindicated in pregnancy Animal studies have shown immunological and neurobehavioral effects
Chlordecone (Ketone)	Male: Oligospermia, decreased sperm motility, but no loss of fertility
Cigarette smoke	(See Tobacco smoke - environmental)
Ciguatoxin	Category B (a case report of fetal agitation with neonatal facial palsy and meconium aspiration after preterm maternal ciguatoxin poisoning noted Breastfeeding: Excreted in breast milk
Cycloheximide	Human studies lacking, but cycloheximide is a known protein synthesis (meiosis) inhibitor defects in rats and mice, but not in rabbits
2,4-D	(See 2,4-Dichlorophenoxy acetic acid)

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DBCP	Male: Toxicity (lowered number of sperm)
DDT (p,p'Dichlorodiphenyltrichloroethane)	<p>Pregnancy: Possible association with spontaneous abortion, toxemia, and low birth weight</p> <p>Developmental: Little teratogenic potential However, there is concern about cumulative (over several generations) reproductive toxicity, due to bioaccumulation and widespread environmental exposure</p> <p>Breastfeeding: Excreted in human milk, no reported effects</p>
DEHP	(See di(2-ethylhexyl) Phthalate)
1,2-Dibromo-3-chloropropane	(See DBCP)
2,4-Dichlorophenoxy acetic acid	<p>Male: Abnormal sperm shape, altered sperm transport</p> <p>Pregnancy: Associated with spontaneous abortion and premature birth</p> <p>Developmental: One report of multiple congenital anomalies teratogenic in several animal species</p>
di(2-ethylhexyl) Phthalate	Developmental: "Concern" about developing male reproductive tract
Dinocap (fungicide)	Animal data: Developmental toxicity: Increased post-implantation mortality, reduced newborn viability, abnormalities of the musculoskeletal and hepatobiliary systems, craniofacial abnormalities, behavioral abnormalities, and delayed growth in mice
Dinoseb (herbicide)	<p>Male: Reduced fertility index in rats, decreased seminal vesicle weight, decreased sperm count and increased incidence of abnormal sperm</p> <p>Developmental: Decreased pup weights, developmental malformations and/or anomalies, an increased incidence of an absence of ossification for a number of skeletal sites and supernumerary ribs neural tube defects</p>
2,4-Dinitrotoluene	Male: Lowered number of sperm
2,6 Dinitrotoluene	(See 2,4-Dinitrotoluene)
Dioxin	(See TCDD or specific compound)
Disodium cyanodithiomidocarbonate	Developmental: Both maternal and fetal effects in rabbits and rats

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Epichlorohydrin	Male: Impaired fertility, however, human data do not confirm animal data demonstrating impaired male fertility
2-Ethoxyethanol	(See Ethylene glycol monoethyl ether)
Ethyl alcohol	(See Ethanol under Drug Hazards)
Ethyl carbamate	(See Urethane)
Ethylene dibromide	Male: Reproductive toxicity (lowered number of sperm, abnormal sperm shape, altered sperm transport)
Ethylene glycol monoethyl ether	Male: Lowered number of sperm Male and female reproductive effects in multiple animal species
Ethylene glycol monomethyl ether	Male and female reproductive effects in multiple animal species
Ethylene glycol monomethyl ether acetate	Developmental: Hypospadias and other male genital abnormalities (See Ethylene glycol monomethyl ether-toxicological profile is almost identical)
Ethylene oxide	Male: Appears in testes in higher concentrations than in blood, has been associated with sister chromatid exchanges in humans occupationally exposed, but effects on sperm were inconclusive Developmental: Malformations in animals (mice)
Ethylene thiourea	Developmental: Teratogen
Ethyl nitrosourea	Developmental: CNS tumors in rats born to rats exposed in the latter part of gestation
Gasoline	Pregnancy: Fetal gasoline syndrome (narrow forehead, up-slanting palpebral fissures, full cheeks, spastic positioning) with high levels of inhalation exposure ("sniffing")
Hexachlorobenzene	Fetal death due to pembe yaraiiii Breastfeeding: Possible association with porphyria cutanea tarda symptoms, reduced growth, and arthritic changes in the appendages (excreted in human milk) skin rash, diarrhea, vomiting, dark urine, neurotoxicity, death
Hexamethylphosphoramide	Testicular atrophy and aspermia (rats), testicular development inhibition (cockerels)

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Hexamethylphosphoric triamide)	(See Hexamethylphosphoramide
HMPA	(See Hexamethylphosphoramide)
Iodides	(See Iodine)
Iodine	Category A Breastfeeding: Not compatible (concentrated in breast milk, and long term use may adversely affect the nursing infant's thyroid activity)
Kepone®	(See Chlordecone)
Lead (Pb)	Male: Lowered number of sperm, abnormal sperm shape, altered sperm transport Female: Premature membrane rupture and preterm births Developmental Breastfeeding: Possible neurotoxicity
Mercury and mercury compounds (see specific compound)	Breastfeeding: May affect neurodevelopment. Present in breast milk
Mercury, elemental	Male: Maternal spontaneous abortions Female: Reproductive failure Developmental: Decreased birth weight Breastfeeding: May affect neurodevelopment [
Mercury, inorganic	Spontaneous abortion
Mercury, organic	Developmental (CNS neurological impairment Breastfeeding: May affect neurodevelopment
2-Methoxyethanol	(See Ethylene glycol monomethyl ether)
Methyl benzimidazole carbamate	(See Carbendazim)
Methyl Cellosolve acetate	(See Ethylene glycol monomethyl ether acetate)
Methylene blue	Category C Category A if injected intraamniotically (hemolytic anemia, jaundice, intestinal atresia with intra-amniotic injection)
Methyl isocyanate	Pregnancy: Associated with spontaneous abortion and neonatal deaths

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Methyl mercury	(See also Mercury, organic, and Mercury and mercury compounds) Pregnancy: Microcephaly, cerebral palsy, abnormal reflexes, abnormal dentition, neurological deficits Breastfeeding: May affect neurodevelopment
Methylmethane sulfonate	Pregnancy: Embryo lethality and malformations in rats, embryotoxicity in mice
Methylnitrosourea	Animal data: Male: Malformed ribs in offspring of exposed males Developmental: Teratogenic in rats (microcephaly and mice (in mice it was teratogenic and embryolethal one-half day before implantation
MIC	(See Methyl isocyanate)
Mirex	Animal studies only Male: Decreased sperm counts and fertility Female: Decreased litter size and number of offspring Developmental: Increased resorptions and stillbirths, arrhythmias, and other anomalies Breastfeeding: Appears in human milk
α -Naphthyl-N-methyl carbamate	(See Carbaryl)
Nickel	Pregnancy: Increased structural malformations and spontaneous abortions in occupationally exposed women who also lifted heavy weights and may have experienced heat stress
o,p'-DDT	(See DDT)
Oryzalen	Male: One report of spontaneous abortion and heart defects born to spouses of occupationally exposed males
Oxydemeton methyl	Developmental: Human case report (multiple cardiac defects, bilateral optic nerve colobomas, left eye microphthalmia, cerebral and cerebellar atrophy, and facial anomalies Animals: Chick embryos, rats
p,p'-DDT	(See DDT)

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p,p'-Dichlorodiphenyl trichloroethane	(See DDT)
PCBs	(See Polychlorinated biphenyls)
Perchloroethylene	Male: Altered sperm transport Breastfeeding: Obstructive jaundice, dark urine
Polychlorinated biphenyls (PCBs)	Yusho Disease/Yu-Cheng Disease (hyperpigmentation, low birth weight, nail and conjunctival abnormalities, neurobehavioral deficits, developmental delays Breastfeeding: Discontinue (appears in human milk; exposures are higher in nursing infants than in utero may cause lack of endurance, hypotonia, sullen expressionless faces
Sevin®	(See Carbaryl)
TCE	(See Trichloroethylene)
TCDD	Male: No known effects, limited/ suggestive evidence of an association with spina bifida in offspring born to males exposed to Agent Orange, which also contained other substances Female: Inconclusive current study results of exposures in Seveso, Italy pending Breastfeeding: Present in human milk
Tetrachloroethylene	(See Perchloroethylene)
Tobacco smoke - environmental (secondary/passive)	Males: Decreased fertility (fecundability) Pregnancy/developmental: LBW at term, small-for-gestational-age, adverse effects on IQ in females, decreased fertility (fecundability) in adult females, specifically including those who were exposed to tobacco smoke <i>in utero</i> and who currently smoke (as adults)
Toluene	Significant delays in fetal growth following chronic and excessive industrial accidents or intentional abuse Toluene embryopathy has been reported (motor and intellectual effects) (developmental delay, CNS dysfunction, hydronephrosis, ventricular septal defects, craniofacial and limb anomalies including microcephaly Animal studies also suggest developmental toxicity with respiratory exposure

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Toluenediamine	Male: Lowered number of sperm
Toluene-2,4-diamine	(See Toluenediamine)
Trichlorfon	Male: One report of diminished seminal fluid volume, sperm count, motility, and viability, and increased number of abnormally shaped sperm Pregnancy: One report possibly associating consumption of contaminated fish with congenital abnormalities, skeletal abnormalities in several animal species
Trichloroethylene	Male: impotence (occupational exposure) Female: amenorrhea, irregular menses (after accidental exposure to high levels)
Urethane (ethyl carbamate - NOT "polyurethane")	Animal data: Oncogenic in several mammalian species; crosses the placenta, genotoxic in mice, preconception exposure of male and female mice produced neoplasms in offspring
VCM	(See Vinyl chloride)
Vinyl chloride (monomer- not polyvinyl chloride or PVC)	Fetal loss in wives of exposed males, CNS defects in communities of polyvinyl chloride polymerization plants Increased incidence of birth defects (not limited to a single organ system, association lacking substantiation)
Xylenes	Female: Menstrual disorders Pregnancy: Possible association with spontaneous abortion, "adverse effects" with high levels of maternal exposure. Xylene has known neurological effects, but insufficient human data to confirm neurological effects from in-utero exposure

*Source for this list is Table 8, NEHC 6260-TM-06