Reproductive hazards

are substances or agents that may affect the reproductive health of women or men or the ability of couples to have healthy children. Hazards may be chemical, physical or biological. Examples of reproductive hazards are lead (chemical), radiation (physical) and certain viruses (biological). –OSHA

Reproductive hazards include physical hazards, biological hazards, heavy metals, radiation, anesthetic gas, sterilants, flame retardants, solvents, pesticides, fungicides, endocrine disruptors, drugs and other chemicals. Some are listed below.

Acetaldehyde
Acrylic acid
Aflatoxins
Anesthetic gas and nitrous oxide
Aniline
Arsenic
Benzene
Benzo(a)pyrene
Cadmium
Carbon disulfide
Chromic acid
Chloroform
Chloroprene
Di (2-ethyl hexyl) phthalate (DEHP)
Dibromo-chloropropane (DBCP)
Dibutyl phthalate (DBP)
Dieldrin
N,N-dimethylacetamide
Dimethylformamide (DMF)
Dimethyl sulfoxide (DMSO)
Dinitro-octyl phenol
Dinitro-toluene (DNT)
Di-sec-octyl-phthalate
Diphenylamine
Dithane
Estradiol
Ethylene oxide
2-Ethoxyl ethanol
2-Ethoxyetylacetate
Ethyl thiourea
2-ethylhexanol
Flame retardants
Formaldehyde
Formamide
Glycol ethers
Glutaraldehyde
Halothane
Hexachlorobenzene
Hexafluoroacetone
Hydrazine(s)
Iodoacetic acid
Karathane (fungicide)
Lead compounds
Mercury compounds
2-Methoxyethanol
2- Methoxy-ethyl acetate
Methyl alcohol
Methyl chloride
Methylene chloride
N-methyl-2-pyrolidone
Nitrobenzene
Nitrous oxide
Pesticides
Peracetic acid
Phenol
Polychlorinated biphenyls
Polybrominated biphenyls
Propylene
Propylene glycol
monomethyl ether acetate
Propylene oxide
Quaternary ammonia cmpds
Systhane (fungicide)
TOK (herbicide)
Toluene
Trichloroethylene
Vinyl chloride
Xylene

Lead
Mercury
Cadmium
Cobalt

Brucellosis
Chicken pox/shingles
(varicella zoster virus; VZV)
Coccidioidomycosis
COVID-19 (SARS CoV-2)
Cytomegalovirus (CMV)
Ebola virus
Hepatitis B, C, and E viruses
Human Immunodeficiency Virus
(HIV)
Herpes Simplex II
Influenza/pneumonia
Leptospirosis
Listeria
Malaria
Measles
Fifth disease (Parvovirus B19)
Rubella (German measles)
Toxoplasmosis
Zika Virus

Ionizing radiation
Non-ionizing radiation
Extreme Heat
Loud Noise
Excessive vibration

Shift work and long hours
Prolonged standing
High physical demand, such as
heavy lifting
Stress

The CDC receives requests for information about workplace reproductive hazards. The most common requests for exposure information concerned: solvents (14%), anesthetic gases (10%), formaldehyde (7%), infectious agents in laboratories (7%) or health care settings (7%), and physical agents (14%), and included ionizing radiation (6%).

Anesthetic Gas

Exposure to trace concentrations anesthetic waste gases like nitrous oxide and halogenated anesthetic gases (halothane and gases ending with "–flurane") are associated with increased risk of miscarriage according to NIOSH. This can occur due to leaks, poor scavenging systems, and poor ventilation in recovery areas. It is unclear what level of exposure is dangerous. In one study of nitrous oxide, dental assistants exposed less than 3 hours/day had no increased risk. It is also unclear if operating room "stress" contributes to miscarriages rather than the gas. Nonetheless, it is best to avoid operative environment if the concentration of waste gas has not been minimized. If absolutely required, and changes can not be made to the risk for exposure and ventilation, one could balance the use of short periods of respirator use, as this also presents a possible hazard.

Formaldehyde

Exposure to formaldehyde (formalin) as a tissue preservative has been associated with increased risk of fertility problems and miscarriages according to NIOSH. At very high levels it can also enter breast milk. Formaldehyde is also known to increase risk for cancers and can be irritating to skin and lung, including creating sensitivities. Sampling for formaldehyde at the workplace can identify the air concentration (in parts per million) and help guide workplace improvements to reduced exposure. Formaldehyde can also remain on skin, hair, and clothing, so care should be taken not to continue exposure to these items after leaving work. Formaldehyde can also break through protective gloves and be absorbed in the skin. All of these should be considered in reducing exposure.

Respirators and Pregnancy

The use of N95 respirators has been evaluated during pregnancy and found to be safe. However N95 respirators do not provide significant protection from chemicals. The use of tight fitting rubber (elastomeric) half face cartridge respirators with chemical cartridges, do provide chemical protection. Their use during pregnancy is not well studied, but have been shown to required a mild increased demand from the cardiopulmonary system in pregnant women. Also, cartridges must be changed very frequently to protect from most volatile chemicals. Speak with a knowledgeable safety or health professional before use of tight fitting rubber respirators with chemical cartridges during pregnancy.

References

ChemHAT (look-up tool) - **chemhat.org/**
OSHA website- **www.osha.gov/reproductive-hazards/**
NIOSH website - **www.cdc.gov/niosh/topics/repro/**
NIOSH Antineoplastic and Hazardous **Drugs** (pg 26, Group 3 - Reproductive)
www.cdc.gov/niosh/docs/2016-161/

When

Hazards can have effects throughout reproduction.

Before Conception

- Decreasing sex drive
- Decreasing fertility
- Decreasing the number and/or quality of sperm produced
- Damaging eggs
- Accumulating in the body where they can affect a developing fetus after conception.

During Pregnancy

- Increased workplace injury and illness in the mother due to factors related to physiologic changes during pregnancy
- Miscarriage
- Preterm delivery and/or low-weight births
- Birth defects
- Problems with the child's later development.

Breastfeeding

- Child's development

Identify and Protect at Work

If you have concern, what do you do next?

Follow these initial steps:

1. Collect information at workplace.
2. Do your own research (see References).
3. Speak to your doctor about hazards and your own personal health concerns.
4. Ask doctor for their ideas and suggestions about work.
5. Share your doctor's recommendations about work with your manager. If additional help is needed, contact Biosafety Office.

Consider **most effective** changes first, in this order:

1. Eliminate hazard.
2. Replace hazard with non-hazardous.
3. Isolate hazard from you, or you from hazard.
4. Change workpractice to reduce hazard.
5. Wear personal protective equipment with caution