Reproductive hazards: Small exposures with big impacts

Many of us are familiar with chemical hazards like acids that burn skin or substances that cause cancer. But did you know that some chemicals can harm reproductive systems and functions?

Chemicals can be used in industries before their full toxic effects are known. Often, the best practice for chemical exposures is to reduce levels to as low as reasonably achievable (ALARA).

As part of a workplace hazard communication program, understanding reproductive hazards along with other hazards is important. Reproductive health is a sensitive and private matter for both men and women. Communicating with workers about the hazards associated with their work enables them to make informed decisions.

To determine whether a product poses a reproductive hazard, consult the safety data sheet (SDS). Look for hazard statements that indicate the product may cause reproductive harm, like "MAY IMPAIR FERTILITY" or "MAY CAUSE HARM TO UNBORN CHILD." Hazard classification statements like "Toxic to Reproduction – Category 1A, 1B, and 2" and pictograms like the one pictured below also may be used to indicate a reproductive hazard.

When it comes to some reproductive hazards, small exposures can have a big impact on health.

Three potential reproductive hazards:

TGIC (1,3,5-triglycidyl isocyanurate) - inhalation exposure limit: 0.05 mg/m^3 or 50µg/m^3

- TGIC is found mainly in powder coatings. Exposures to TGIC often occur during the production of the material, product handling, and application of powder coatings.
- TGIC poses a male reproductive hazard because it can change DNA. It alters sperm structure, which can result in mutations that can be passed on to future generations.
- Reproductive health impacts are mainly associated with inhalation exposures or ingestion.
- In workplaces where TGIC is used as part of a powder coating process, using a spray booth that is well ventilated and using proper respiratory protection can minimize inhalation exposure.

Lead – inhalation exposure limit: 0.05 mg/m^3 or 50 µg/m^3 and an action level of 30 µg/m^3.

- Some occupational sources of lead include soldering, lead paint (often found on steel structures and older homes), contaminated soil, electronic work, and working at shooting ranges.
- Occupational exposure often occurs through unintentional ingestion, inhalation, and absorption through skin.
- For pregnant workers, lead exposure has been linked to miscarriage, stillbirth, pre-term labor, low birth weight, and birth defects.
- For men, lead exposure impacts hormone levels, resulting in lower sperm count,

abnormal sperm structure, and lowered testosterone levels.

- Lead-contaminated clothing and equipment that is taken home can expose children to lead hazards, which impacts a child's development and learning.

Chemotherapy agents – there are no current occupational exposure limits.

- Chemotherapy agents are chemical compounds (drugs) that fight cancer. Many of these drugs work by targeting and destroying rapidly dividing cells. Because the effects of chemotherapy agents are not specific to cancer cells, they also damage healthy dividing cells such as sperm, eggs, and developing fetal tissue.
- Occupational exposure to chemotherapy agents in the health care industry can occur during receipt of pharmaceuticals, compounding, administration, patient care activities, spills, transport, and waste disposal.
- Routes of exposure can include needlesticks (injection), skin contact (absorption), and inhalation depending on how the substance is being handled.
- Some common chemotherapy agents are cyclophosphamide, 5-fluorouracil, methotrexate, cisplatin, and doxorubicin.

What can be done to prevent exposures:

- Proper use of personal protective equipment (PPE)
  - Evaluate where reproductive hazards are present by reviewing safety data sheets (SDSs) and determine where exposure potential exists by means of inhalation, ingestion, injection, or skin absorption.
  - Ensure that PPE is appropriate for the agent(s) of concern by consulting permeation rates and break through times for gloves, gowns, and respirators.
- Develop decontamination protocols
  - Establish a standardized procedure to decontaminate work areas.
    - Have a spill response plan.
  - Use surface sampling wipes to verify efficacy of decontamination methods.
- Promote good workplace hygiene habits
  - Employees must wash their hands after working with reproductive hazards and not wear contaminated work clothing at home.
  - Floors are one of the most commonly contaminated surfaces in the workplace—so don't wear work shoes at home.
  - Implement environmental wipe sampling to ensure that contamination of hazardous substances is not tracked from "dirty" zones to "clean" zones.

References

1. CDC NIOSH reproductive health page: bit.ly/4lCVEff
2. CDC NIOSH antineoplastic agents page: bit.ly/3J8IZTy
3. OSHA reproductive hazards topic page: osha.gov/reproductive-hazards/hazards
4. Oregon OSHA Lead in Construction publication: https://bit.ly/45I67RC
5. ACGIH TLV documentation: TGIC (1997)