



ENVIRONMENTAL HEALTH & SAFETY

## Reproductive Health Hazards Guidance Document

If you are pregnant or potentially pregnant, you should contact the University of Colorado Denver | Anschutz Medical Campus Department of Environmental Health and Safety (EHS) for guidance and to report your condition (main number 303-724-0345). Reporting your condition is voluntary. The first point of contact should be the [EHS Occupational Health](#) Clinic (to schedule an appointment call 303-724-9145). The occupational health nurse will review what you are working with, your health history, and go over concerns you may have. Once you have spoken to or seen the Occupational Health RN, you will be referred to the EHS Industrial Hygiene division. Specific reporting and controls are recommended for employees that work with [radioactive isotopes](#) or ionizing radiation generating machines. If you continue breast feeding after you return to work, you may also want to contact EHS for guidance.

The EHS Industrial Hygienist can assist you by conducting a workplace hazard assessment to determine the nature of the potential exposures in your specific work setting and make recommendations about controls to avoid exposure. Different health hazards in the laboratory have different health effects – for example, reproductive toxins, mutagens, teratogens, and embryotoxins – and impact women, men, and embryos differently. These controls may include administrative practices (e.g., altering your work practices or substituting less hazardous materials for chemicals used), engineering controls (such as the use of biosafety cabinets or fume hoods), or the use of personal protective equipment (PPE). cursory or general guidance is provided in this document, but to ensure that the nature of the controls you employ are protective for your specific circumstances, contact EHS by calling 303-724-0345 and ask for the industrial hygienist.

### Confidentiality

You may make inquiries to the EHS Occupational Health clinic or Industrial Hygienist regarding exposures and hazards of your work setting without identifying your specific circumstances or identity, and without needing to disclose your circumstances to your department. General information shared is kept confidential. However, if alterations to work are necessary for safety (e.g., fit testing for a respirator and subsequently use of respiratory protection), or if the conditions of your work circumstances place you or your unborn child at risk, it may be necessary to communicate with your supervisor or other department representative to make recommendations about safety.

An assessment can be conducted of your work area to identify the risks present and this can be conducted without needing to share information with others in the laboratory. This would be treated as an unannounced laboratory inspection.

Please keep in mind that [pregnancy](#) is a protected condition at the University of Colorado Denver | Anschutz Medical Campus. [Human Resources](#) and the [Office of Equity](#) can provide additional information on your rights.

### Radiation Safety

Ionizing radiation is a known reproductive hazard. It has been linked to birth defects and other reproductive problems. Exposure to ionizing radiation at work may increase your chances of having reproductive problems. It is important to follow all controls and safety protocols when working with sources of ionizing radiation.

There are specific federal and state regulations and license requirements that apply to pregnant workers exposed to radiation or radioactive materials. The [EHS Radiation Safety](#) division ensures compliance to these requirements and also manages the purchase, use, and disposal of radioactive materials for the University of Colorado Denver | Anschutz Medical Campus. Additionally, they provide monitoring for



personnel exposures to radioisotopes. To provide you with adequate monitoring during pregnancy, you must report your condition to the Radiation Safety Officer by completing a [Declaration of Pregnancy](#) form. Review the guidelines in the Radiation Safety Manual and fill out the declaration form. Following this, EHS Radiation Safety will issue you a special fetal monitor.

## Chemical Safety

There are workplace chemical hazards that can be harmful to pregnant or breastfeeding women, or for members of the worker's household if a worker carries home contaminants from the workplace on clothes, skin, and shoes. It is important to follow all safety protocols and use appropriate PPE when working in the laboratory or clinic setting.

If you are pregnant, it is important to discuss your workplace activities and the materials you use both in the workplace and at home with your OB/GYN. Additionally, contact [EHS Industrial Hygiene](#) to discuss the materials you work with and to coordinate a workplace hazard assessment as needed. A hazard assessment may also include air sampling depending on the nature of the hazards present.

The following is a list of potential reproductive hazards that may be present in the laboratory or research clinic setting. This list is not exhaustive; you can find additional information from the Centers for Disease Control and Prevention (CDC) on [reproductive health and the workplace](#) and [specific exposures](#). For a specific review of the chemicals you work with, contact the EHS Industrial Hygienist. Additionally, you should always review current [Safety Data Sheets](#) (SDS) for materials that you use in your work. If materials present a known reproductive risk, this should be identified within the SDS. Some of the common exposures at the Anschutz and Denver campuses may include:

- [Anesthetic Gases](#)
- [Antineoplastic \(Chemotherapy\) Drugs](#)
- [Chemical Disinfectants and Sterilants](#)
  - [Glutaraldehyde](#)
  - [Ethylene oxide](#)
- [Formaldehyde](#) (very limited evidence)
- [Solvents](#)
- [Lead and other Heavy Metals](#) (use in research or as radiation shielding)

Additional information on some materials used routinely within our campus settings is provided below.

### *Formaldehyde/Embalming Fluids/Fixatives*

Limited research studies are available on the reproductive hazards to the fetus resulting from *airborne* exposures to formaldehyde. In the laboratory, ventilation and the use of fume hoods greatly reduces the potential for exposure when using proper work practices. Higher hazards exist from potential of ingestion, which can occur from poor sanitation practices. Methanol/alcohol is a teratogen via ingestion.

If you work routinely with formaldehyde solutions (>4-10%), you may need to have sampling conducted and enroll in the EHS Formaldehyde Medical Surveillance program. Contact the EHS Industrial Hygienist for additional information.

### *Anatomy or Work with Preserved Cadavers or Specimens*

At the Anschutz and Denver campus locations, anatomy coursework is conducted in specially designed classrooms and on downdraft tables that exhaust chemical vapors present in embalming fluids or other fixatives. Routine sampling in these areas for formaldehyde is conducted by EHS Industrial Hygiene and results are available upon request. The initial sampling included methanol and phenol, which are also ingredients of embalming fluids. If you are conducting this type of work outside of these classroom settings, contact EHS and ask for the Industrial Hygienist for an assessment of your work area.

For added protection, respiratory protection is available in the form of a carbon impregnated N95 respirator. The N95 respirator is less likely to present a hazard to pregnant workers than a full or half face respirator, but use of any form of respiratory protection requires medical approval. Because the use is



voluntary for students taking these courses, simply check with your OB/GYN about the use of this respirator. EHS can assist you with information to present to your physician.

Always wear scrubs and/or lab coat when in these settings. It is recommended that you wear disposable gowns and dispose of these each time you leave the classroom. These should be worn in addition to the minimum PPE described in the [PPE](#) section of this document.

### *Work with 4% Formalin*

Unless you are mixing dilutions in the laboratory, most work with formalin should not present a serious hazard when work is infrequent and/or for small amounts as long as you are following proper laboratory safety protocol, including proper hygiene and hand washing and you wear appropriate [PPE](#). Any preparations of volatile chemicals should be performed in a properly functioning chemical fume hood.

### **Anesthetic Gases**

Studies have found associations with exposure to certain anesthetic gases and reproductive problems. It is important to follow the safety protocol established for your workplace and specific work activities and use appropriate [PPE](#). It is also important to use waste gas scavenging devices. As noted above, the CDC has published Information about [anesthetic gas hazards](#) and EHS has waste anesthetic gas guidelines.

### **Infectious Agents**

*The following information is adopted from the CDC information on [reproductive health and the workplace](#).*

Working with or exposure to certain bacteria, viruses, or other infectious agents may increase your chances of having a miscarriage, a baby with a birth defect, or other reproductive problems. Some infections can pass to an unborn baby during pregnancy and cause a miscarriage or birth defect. Infections like seasonal influenza (flu) and pneumonia can cause more serious illness in pregnant women ([CDC](#)).

These and other infections can pass to the unborn baby during pregnancy, or cause more severe illness to a pregnant woman:

- [Chicken pox](#) (varicella zoster virus)
- [Coccidioidomycosis](#)
- [Coxiella burnetii](#) (Q fever)
- [Cytomegalovirus](#) (CMV)
- [Ebola virus](#)
- [Hepatitis B virus](#) (HBV)
- [Hepatitis C virus](#) (HCV)
- [Hepatitis E virus](#) (HEV)
- [Human Immunodeficiency Virus](#) (HIV)
- [Herpes](#)
- [Influenza](#)
- [Listeria](#)
- [Malaria](#)
- [Measles](#)
- [Parvovirus B19](#) (Fifth disease)
- [Rubella](#) (German measles)
- [Toxoplasmosis](#)

### **Work in the Perinatal Research Facility (PRF)**

If you are pregnant, or plan on becoming pregnant, and work in the PRF (especially in the area that houses the sheep), you are at a greater risk for developing Q fever. *Coxiella burnetii* is a highly infectious agent that is resistant to heat and drying, and difficult to eradicate in the environment. It can become airborne and inhaled by humans. A single *C. burnetii* organism may cause disease in a susceptible person. Q fever can cause acute or chronic illness in humans, who usually acquire infection after contact



with infected animals or exposure to contaminated environments. The acute symptoms caused by infection with *Coxiella burnetii* (flu –like symptoms) usually develop within 2-3 weeks of exposure, although as many as half (50%) of humans infected with *C. burnetii* do not show symptoms.

High risk individuals may go on to develop chronic Q fever if infected with acute Q fever. The three groups at highest risk for chronic Q fever are pregnant women, immunosuppressed persons and patients with pre-existing heart valve defects. Q fever infections in women that occur shortly before conception or during pregnancy might result in miscarriage, stillbirth, premature birth, intrauterine growth retardation, or low birthweight. Adverse pregnancy outcomes are likely to be caused by vasculitis or vascular thrombosis resulting in placental insufficiency, although direct infection of the fetus has been documented. Of the reports that describe outcomes of infected pregnant women, none have documented an increased risk for congenital malformations because of infection.

Although we cannot prevent you from working in the PRF when pregnant, we highly discourage it. Please consider discussing your pregnancy with your supervisor, as they most likely will not want you to work in the PRF while pregnant.

## Exposure Control

### General Guidelines

- Make sure your vaccines are up to date. Seasonal flu and other illnesses can cause more serious illness in pregnant women.
  - It is recommended that you get a Tetanus, diphtheria and acellular Pertussis (TdaP) vaccine for each pregnancy, to protect your child against pertussis (whooping cough).
  - Get your seasonal flu shot. If you are pregnant, you should get the trivalent or quadrivalent flu shot (inactivated vaccine) and not the nasal vaccine (LAIV, live attenuated nasal vaccine).
  - Do not get the MMR (measles mumps rubella) vaccine or Varivax (chickenpox) vaccine during pregnancy. They are LIVE vaccines and contraindicated during pregnancy. If you are a pregnant healthcare worker who is not vaccinated and not immune, do not work with rubella-infected patients, or anyone with potential flu or chicken pox. Rubella infection is dangerous for pregnant women and their babies.
  - Learn more about [vaccines for pregnant women](#).
- Wash your hands often if you are around someone who is sick, and especially in flu season (September to March/April).

### Lab, Healthcare/Clinic, OLAR/animal work

Report your condition (voluntary) and any changes to your work activities to [Occupational Health](#).

- Complete the Blood borne Pathogens training online ([Skillsoft](#))
- Follow recommended infection control guidelines (standard precautions) carefully. If you follow these guidelines, you will be generally at no higher risk of catching a harmful infection from a patient than other workers. Learn more about [infection control in general healthcare settings](#).
- If you work directly with unusual pathogens or with patients infected with unusual pathogens or emerging infections, contact the [Biosafety Officer](#) for more information about working with these agents during pregnancy.
- Complete the Laboratory Safety training ([Skillsoft](#)). Follow safety guidelines for laboratory workers. These guidelines will help you prevent laboratory-acquired infection when followed correctly.
- For laboratory work with concentrated cultures of pathogens, contact the EHS [Biosafety Officer](#) or [Industrial Hygienist](#).
- Ensure that you are using biosafety cabinet that is appropriate to the type of work activity and materials that you are using. Contact [Biosafety Officer](#) or [Industrial Hygienist](#) if you have questions about this.

## Personal Protective Equipment

The minimum level of PPE that you should wear in the laboratory or clinical setting is provided below. Please note that you should contact EHS to confirm any additional PPE needs based on the specific



activities you perform and the materials that you use. Lab PPE should not be taken home or worn outside of the lab setting. Gloves should always be removed and replaced when ripped or torn and upon leaving the patient area or lab. Wash hands upon leaving a lab; in between glove changes. Sanitize or wash hands after visiting with a patient and/or removal of gloves.

- **Gloves:** should be appropriate for the job task and compatible with the chemicals and concentrations you work with). Check the manufacturers break through and compatibility charts to confirm you have the right glove type. The glove should be the proper size for you.
- **Eye Protection:** should be appropriate for the nature of the work conducted.
  - Splashes of hazardous substances possible – wear goggles and face shield or just splash goggles as appropriate to the risk.
  - Projectiles – use shatter resistant, ANSI rated safety glasses or goggles.
- **Face Protection:** When there is potential for hazardous debris to reach your face a face shield or surgical mask should be worn as applicable to the nature of the hazard. Examples of risks are diverse (e.g., conducting dental procedures, sawing cadaver part, drawing large volume of blood, ER, dispensing chemicals, etc.) and each may present a different level of risk.
- **Lab Coat** and proper clothing: request professional laundering service rather than taking these home for washing
  - Lab – long sleeves, long pants/shirt, shoes that completely cover the foot
  - Clinic – scrubs
  - Allergens or particulate gross contamination – use disposable foot covers and hair net
- **Respiratory Protection:** Contact EHS for a hazard assessment to determine if you should wear a respirator. Employees must be enrolled in the EHS [Respiratory Protection Program](#) and:
  - Medically approved to wear a respirator (this should include communication and approval from your OB/GYN if pregnant)
  - Fit tested to the same style and size respirator they will use.
  - Take respiratory protection training

## Physical/Energy Hazards

Beyond chemicals and infectious agents, physical hazards can pose a risk to the unborn child. This includes [ionizing radiation](#), which is covered under the Radiation Safety section, as well as [non-ionizing radiation](#). Loud noises and potentially vibrations can pose a risk. Excessive heat can also become a concern. Generally, there are few instances of these hazards in the lab or clinic setting. If you believe that you do have this type of exposure, consult with the EHS. EHS can conduct noise level readings of your area and suggestion shielding or other controls depending on the nature of the hazard.

Long or irregular work shifts, as well as lifting bending and standing for long periods can present additional risk to pregnant woman. Always consult with your OB/GYN about your work and any changes to your working conditions.

## Resources

CDC/National Institute for Occupational Safety and Health (NIOSH), Reproductive Health and the Workplace:

- Webpage: <http://www.cdc.gov/niosh/topics/repro/default.html>
- What you should know: <http://www.cdc.gov/niosh/topics/repro/femaleHealthImpact.html>

The Effects of Workplace Hazards on Female Reproductive Health:

- Webpage: <http://www.cdc.gov/niosh/docs/99-104/>
- Document: <http://www.cdc.gov/niosh/docs/99-104/pdfs/99-104.pdf>

## Related Articles

Collins, J., et al (2001) A review of adverse pregnancy outcomes and formaldehyde exposure in human and animal studies. *Regulatory Toxicology and Pharmacology* 34, p17-34.

CDC MMWR, March 29, 2013, Diagnosis and Management of Q Fever- US 2013, Vol 62, No. 3, page 5