



ENVIRONMENTAL HEALTH & SAFETY

Reproductive Health Hazards Guidance

If you are pregnant or potentially pregnant, the University of Colorado Anschutz Medical Campus Department of Environmental Health and Safety (EHS) is available to provide guidance and education on pregnancy risks associated with your research and offer advice on additional precautions. Reporting your pregnancy status is voluntary, and inquiries are kept confidential. General guidance is provided in this document, but to ensure the nature of controls used are protective for your unique circumstances and health history, please start by contacting Occupational Health by [email](#) or by calling (303) 724-9145. You will then be referred to the EHS Industrial Hygiene division, who will assess whether additional controls are recommended. Specific reporting and controls are recommended for employees that work with radioactive isotopes or ionizing radiation generating machines. If you continue breast feeding after returning to work, additional guidance may be provided.

Occupational Health

Please contact the [Occupational Health Clinic](#) to schedule a pregnancy consultation. In this appointment, a nurse will review the agents you are working with, your health history, and address any concerns you may have. [Report exposures to Occupational Health](#) and your OB/GYN; we are always here to help if something happens at work!

Research Safety and Industrial Hygiene

After your Occupational Health consultation, you will be referred to the Research Safety and Industrial Hygiene division. One of our industrial hygienists may conduct a workplace hazard assessment to determine the nature of potential exposures in your specific work setting and make recommendations on additional controls to avoid exposure. There are various laboratory health hazards (reproductive toxins, mutagens, teratogens, and embryotoxins) that can impact adults and embryos differently. Controls to avoid exposure may include:

- Administrative practices (altering work practices or substituting less hazardous materials for chemicals used)
- Engineering controls (use of biosafety cabinets or fume hoods)
- Personal Protective Equipment (fit testing for a respirator and use of respiratory protection)

Confidentiality

You may make inquiries with EHS regarding exposures and hazards of your work setting without identifying your specific circumstances or identity, and without needing to disclose information to your department. The information shared is kept confidential; however, if alterations to work are necessary for safety or conditions of your work setting place you at risk, it may be necessary to communicate safety recommendations to your department supervisor or representative.

An assessment may be conducted of your work area to identify the risks present, which can be done privately and without sharing information with the laboratory; this would be treated as an unannounced laboratory inspection.



Pregnancy is a protected condition at the University of Colorado Anschutz Medical Campus; [Human Resources](#) and the [Office of Equity](#) can provide additional information on your rights.

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Occupational Health Contact Information



occupational.health@cuanschutz.edu



<https://research.cuanschutz.edu/ehs/home/divisions/occupational-health>



(303) 724-9145

Research Safety and Industrial Hygiene Contact Information



<https://research.cuanschutz.edu/ehs/home/divisions/research-safety-and-industrial-hygiene>



(303) 724-0249

1. Radiation Safety

Ionizing radiation is a known reproductive hazard and has been linked to birth defects and other reproductive issues. Exposure to high levels of ionizing radiation at work may put you at risk, so it is important to follow all radiation safety requirements when working with sources of ionizing radiation.

There are specific state regulations that apply to pregnant workers exposed to sources of ionizing radiation. The [Radiation Safety](#) division ensures compliance to these requirements and also manages the purchase, use, and disposal of radioactive materials for the University of Colorado Anschutz Medical Campus. Additionally, they provide monitoring for occupational exposure to radiation. For fetal monitoring during pregnancy, you have the option to declare your pregnancy to the Radiation Safety Officer by completing a [Declaration of Pregnancy](#) form and reviewing the guidelines in the [Radiation Safety Manual](#).

2. Chemical Safety

There are workplace chemical hazards that can be harmful during pregnancy and breastfeeding and may also affect family members if contaminants are carried home on clothing, skin, or 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 in the workplace with your OB/GYN.

The following is a list of potential reproductive hazards that may be present in the laboratory or clinical research setting. This list is not exhaustive; additional information can be found at the Centers for Disease Control and Prevention (CDC) page on [reproductive health and the workplace](#) and [specific exposures](#). For specific review of the chemicals you work with, contact EHS. Review [Safety Data Sheets](#) (SDS) for materials used in your work; materials with a known reproductive risk will 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](#)
- [Solvents](#)
- [Lead and other Heavy Metals](#) (use in research or as radiation shielding)

Additional information on some materials used routinely in the campus setting is provided below.

Formaldehyde/Embalming Fluids/Fixatives

Limited research studies are available on the reproductive hazards associated with *airborne* exposure to formaldehyde. In the laboratory, ventilation or the use of fume hoods reduces the potential for exposure when using proper work practices. Higher hazards exist from the potential of ingestion, which can occur from poor sanitation practices; ingestion of methanol/alcohol can act as a teratogen.

If you work routinely with formaldehyde solutions ($\geq 37\%$), you may need to enroll in the EHS Formaldehyde Medical Surveillance program. Contact the [Research Safety and Industrial Hygiene](#) division 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 on downdraft tables that exhaust chemical vapors present in embalming fluids or other fixatives. Routine formaldehyde sampling in these areas is conducted by the Research Safety and Industrial Hygiene division, and results are available upon request. Initial sampling includes methanol and phenol, which are also ingredients of embalming fluids. If you are conducting this type of work outside of these classroom settings, contact the Research Safety and Industrial Hygiene division for an assessment of your work area.

In some cases, respiratory protection may be recommended or required. The carbon impregnated N95 respirator is less likely to present a hazard to pregnant workers than a full or half face respirator. However, use of any form of respiratory protection requires medical approval. The use of an N95 respirator is voluntary for students taking these courses, and EHS can assist you with information to present to your physician.

Always wear scrubs and/or a lab coat in these settings. A single-use disposable gown is recommended when you enter the classroom and should be worn in addition to the minimum Personal Protective Equipment (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 with small amounts, as long as proper laboratory safety protocol (hygiene, hand washing, and appropriate PPE) are followed. Any preparations of volatile chemicals should be performed in a properly functioning chemical fume hood.

3. Anesthetic Gases



Studies have found associations with exposure to certain anesthetic gases and reproductive issues. It is important to follow safety protocol established for your workplace and specific work activities and use appropriate PPE. It is also important to use waste gas scavenging devices. The CDC has information about [anesthetic gas hazards](#) and EHS has [anesthetic gas safe work practices](#).

4. Infectious Agents

The following information was adopted from the CDC information on [infectious agents, reproductive health, and the workplace](#). For specific questions or additional information, please contact the [Biological Safety](#) division.

Working with or exposure to certain bacteria, viruses, and other infectious agents may increase your chances of having reproductive issues; some infections can pass to an unborn baby during pregnancy and cause a miscarriage or a birth defect. Further, infections like seasonal influenza (flu) and pneumonia can cause more serious illness in pregnant people.

These and other infections can pass to the fetus during pregnancy or cause more severe illness in pregnant people:

- [Varicella Zoster Virus](#) (VZV)
- [Coxiella burnetii](#) (Q fever)
- [Cytomegalovirus](#) (CMV)
- [Hepatitis B virus](#) (HBV)
- [Hepatitis C virus](#) (HCV)
- [Human Immunodeficiency Virus](#) (HIV)
- [Herpes simplex virus](#) (HSV)
- [Influenza virus](#)
- [Listeria](#)
- [Malaria](#)
- [Measles virus](#)
- [Rubella virus](#) (German measles)
- [Toxoplasma](#)
- [Zika virus](#)
- [SARS-CoV2](#)

5. Work in the Perinatal Research Facility (PRF)

If you are pregnant or plan on becoming pregnant and work in the Red Zone of the PRF, you are at greater risk of developing Q fever. *Coxiella burnetii* is a highly infectious agent that is resistant to heat and drying, and difficult to eradicate in the environment. Infection can occur through inhalation or ingestion of the aerosolized bacterium and can cause acute or chronic illness in humans. Acute symptoms caused by *C. burnetii* (flu-like symptoms) typically develop within 2-3 weeks of exposure, although as many as half (50%) of humans infected do not show symptoms.

High risk individuals (pregnant persons, immunosuppressed persons and patients with pre-existing heart valve defects) may develop chronic Q fever following acute infection. Q fever infections occurring shortly before conception or during pregnancy might result in miscarriage,



stillbirth, premature birth, intrauterine growth restriction (IUGR), or low birthweight. Adverse pregnancy outcomes are likely to be caused by vasculitis or vascular thrombosis resulting in placental insufficiency, with some documentation of direct infection of the fetus.

Working in the PRF while pregnant is not recommended.

6. Exposure Control

In addition to vaccines recommended for your research work, the CDC has [vaccine recommendations specific to pregnant people](#). For work directly with unusual pathogens or with patients infected with unusual pathogens or emerging infections, the [Biological Safety](#) division may provide additional information about working with specific agents during pregnancy. Ensure that you are using the correct engineering control:

- A [biosafety cabinet](#) should be used for work with pathogens or materials potentially containing pathogens
- Work with chemicals should be performed in a chemical fume hood

7. Personal Protective Equipment (PPE)

The minimum level of PPE recommended for work in the laboratory or clinical setting is provided below. Please note that the Research Safety and Industrial Hygiene division may have additional recommendations based on specific activities performed and materials used. Lab PPE should not be taken home or worn outside of the laboratory setting.

- **Gloves:** Must be appropriate for the job task, compatible with the chemicals and concentrations you work with, and the proper size. To ensure you have the right glove type, check the manufacturers break through and compatibility charts
 - Remove and replace gloves when ripped or torn and upon leaving patient areas or the lab
 - Wash hands upon leaving patient areas or the lab, between glove changes, and after glove removal
- **Eye Protection:** Should be appropriate for the nature of the work conducted
 - Potential for splashes of hazardous substances – wear goggles and/or face shield as appropriate
 - Projectiles – use shatter resistant, ANSI rated safety glasses or goggles
- **Face Protection:** Where there is potential for hazardous debris to reach your face, a face shield or surgical mask should be worn as appropriate to the nature of the hazard (e.g., conducting dental procedures, sawing cadaver part, drawing large volumes of blood, ER, dispensing chemicals, etc.) and each may present a different level of risk
- **Lab Coat and Proper Clothing:**
 - Lab – long sleeves, long pants/shirt, closed toed shoes
 - Clinic – scrubs
 - Allergens or particulate gross contamination – disposable foot covers and hair nets
- **Respiratory Protection:** Contact EHS for hazard assessment to determine if a respirator is necessary
 - Employees must be enrolled in the EHS [Respiratory Protection Program](#) and:
 - Medically approved to wear a respirator (approval from your physician)
 - Complete fit testing for the same style and size respirator you will use
 - Take respiratory protection training



8. Physical/Energy Hazards

In addition to chemicals and infectious agents, physical hazards can pose a risk during pregnancy:

- Ionizing radiation and non-ionizing radiation
- Loud noises and vibrations
- Excessive heat

There are few instances of these hazards in the lab or clinic setting. If you believe that you are at risk for physical or energy hazard exposures, consult with EHS. Research Safety and Industrial Hygiene 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, lifting, bending, and standing for long periods of time can present additional risks to pregnant people.

9. Additional Resources

- CDC and the National Institute for Occupational Safety and Health (NIOSH) – [Reproductive Health and the Workplace](#)
- CDC/NIOSH – [The Effects of Workplace Hazards on Female Reproductive Health](#)
- Occupational Safety and Health Administration (OSHA) – [Reproductive Hazards](#)
- Canadian Centre for Occupational Health and Safety (CCOHS) – [Reproductive Health- Reproductive Hazards](#)
- 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