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Reproducing Conservators: Health and Safety for Preconception, Pregnancy, and Beyond

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Introduction

According to the Centers for Disease Control (CDC), seventy-five percent of women in the American workforce are of reproductive age and over half of children born in the U.S. are born to working mothers (www.cdc.gov/niosh/topics/women/reproductive-health.html). While the AIC office does not keep statistics on membership gender or age, a look at attendees at the annual meeting reflects a predominantly female membership, many of whom are between the reproductive ages of 20 and 45. Most conservators are already aware that they use chemicals, materials, and equipment that require safety precautions. Conservators of childbearing age as well as those with children may have heightened awareness of this requirement.

This article explores issues relating to chemical exposure, occupational hazards, health and safety precautions, and human resource and legal implications of a reproductive-aged workforce through examination of the current published information on the effects of workplace safety risks on reproduction and consultations with a reproductive toxicologist and other health and safety professionals. Once informed, conservators and their managers and/or employees can make educated choices about their work practices.

Risks of Chemical Exposure During Pregnancy

When a conservator thinks about occupational risks that can affect reproduction, the first concern is usually the chemicals used or encountered on a daily basis. For the purposes of this article, "chemicals" include organic solvents as well as heavy metals such as arsenic and lead that can be found in pigments, pesticides, varnishes, adhesives, and consolidants. They are the materials employed in a conservator's work, and they may affect a conservator when working with them directly or when used by someone else in a common laboratory space. Chemicals pose a variety of risks to the reproductive system, some of which are elevated at particular stages of reproduction.

Research on the Effects of Chemicals on Reproduction

Epidemiological studies on occupational exposure to organic solvents and other chemicals are difficult to perform because the variety used by workers make it impossible to pinpoint the chemical responsible for a particular reproductive outcome (Chevrier et al. 2006). The work settings in many of these studies include biomedical laboratories; manufacturing plants (aircraft, shoe, plastic, leather, etc.); and nail and hair salons. Conservators are not found on any of these lists. These studies have been generally survey-based, reliant on women to fill out and return forms, and not followed up by any medical examination or medical record confirmation. The sample sizes for most of the studies are generally small, often with only a hundred or so respondents, and therefore do not represent the entire workforce. Other confounding factors in these surveys include tobacco smoke,

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alcohol, shift-work, inaccurate memory, and exposure to feto-toxic agents not covered by these surveys (Donald et al. 1991). Statistics therefore gained by this method must be read carefully and are understood as incomplete. Animal testing helps to fill in some blanks of chemical effects on conception and pregnancy, but extrapolating from animal test results to humans necessitates considering biological differences, dosage proportion, and route of administration (Paul and Himmelstein 1988, 923). Combining the results of animal tests with human epidemiological studies, while imperfect, give a glimpse into the effect of chemicals on the human reproductive system and offer some insight into ways a woman should protect herself.

How To Determine Your Chemical Risk Factor

When seeking expert advice from your doctor you will need to have determined your chemical risk. To do this you will need to know the following:

1. What chemicals do you use? Check each product's MSDS.
2. How much do you use?
3. How often do you use it?
4. For how long are you exposed?

The publication *If I'm Pregnant, Can the Chemicals I Work with Harm My Baby?* contains a useful worksheet with additional questions. The Organization of Teratology Information Specialists (OTIS) can assist in developing an occupational risk assessment. (The publication's URL and OTIS contact information are listed in the web resources section on page 8)

Preconception Risks

Studies of time to pregnancy (the amount of time it takes to become pregnant) have been attempted throughout the years, but these often have been performed post-pregnancy and rely on the worker to recall and quantify chemical exposures during an extended period of time (Axelsson et al. 1984). The results of these studies suggest that certain chemicals at high exposure levels can reduce a woman's ability to conceive (Wennborg et al. 2001). While one may assume this only applies to exposure to solvents that conservators consider to be "more toxic" like toluene, one study found a decrease in fecundity after exposure to acetone, a chemical that many conservators use without personal protective equipment (PPE) (ibid). This study did not inform the reader, however, about exposure levels necessary to reach this result, although it can be assumed that the doses of acetone were incredibly high. This finding is referred to here solely as an example of a conservator's often misinformed notion about "safe" chemicals vs. "unsafe" chemicals.

What About Men?

Guess what? Human reproduction cannot happen without a male contribution! Studies have shown that certain chemical exposures to men can affect sperm quantity, shape, and performance (CDC, 1996). This publication specifies lead as one of these chemicals, but does not specify exposure level. Radiation can also affect fertility, but only at extremely high doses, such as from cancer treatments. While male chemical exposure does not appear to relate to birth defects, sperm exposed to certain chemicals can have decreased ability to impregnate. It is therefore important for a man to protect himself using appropriate PPE and following the same guidelines as women while working with chemicals.

Prenatal Risks

During pregnancy, a woman is responsible not only for her health and safety, but for that of the fetus. Epidemiological studies of chemical exposure during the nine-month prenatal stage pose the same difficulties as preconception studies, so they also must be approached as incomplete. For example, miscarriages occur in approximately 15-20% of all pregnancies, making it challenging to assign blame to specific chemical exposure, if one occurs (The American College of Obstetricians and Gynecologists 2011). However, studies have shown that pregnant women exposed to reproductive toxicants may have an elevated risk of miscarriage, especially in the first three months. This increased risk may not relate to how often a woman is exposed, suggesting that even minimal exposure should be taken seriously (Axelsson et al. 1984; McDonald et al. 1987).

Whereas exposure to a specific reproductive toxicant may increase the risk of miscarriage in the first three months, exposure to that same hazard in the final six months may cause birth defects, affect fetal brain development, slow the growth of the fetus, or cause premature labor (NIOSH 1999). It is therefore important to protect oneself throughout the entire pregnancy, not just during the first trimester. Birth defects occur in 3 to 5% of all pregnancies, regardless of teratogenic exposure (Organization of Teratology Information Specialists 2010), and the statistics are not necessarily higher for women working in fields where chemical exposure occurs. However, it is clear that certain chemicals should be treated as potential threats to a pregnancy. For example, birth defects associated with exposure to toluene include cleft palates, limb abnormalities, intrauterine growth retardation, and congenital cranio-facial, cardiac, renal, and central nervous system malformations, but only at exposure levels associated with paint sniffing (Donald et al. 1991). Repeat exposure to chemicals can increase risks, and a synergistic effect of exposure to different chemicals should not be discounted. Solvents are likely more dangerous to the mother's liver and kidney function than to the fetus, but there have been animal studies that show varying degrees of developmental toxicity in fetuses exposed to high doses of toluene in cases without significant maternal toxicity (ibid).

OSHA's Hazard Communication Standard (HCS) Definitions

- Reproductive Toxicant—Chemicals that affect reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis). These chemicals are only reproductively toxic at certain exposure levels; a chemical that affects the reproductive system at one exposure level may not have the same effect at a lower level of exposure. It is therefore not possible to classify any chemical as a reproductive toxicant without taking into consideration the level of exposure.
- Mutagen—A substance or agent capable of altering the genetic material in a living cell.
- Teratogen—Any substance that can cause birth defects (i.e. malformations or alterations in the appearance or function of a developing embryo).

—From Guidance for Hazard Determination, www.osha.gov/dsg/hazcom/ghd053107.html

Postnatal Risks

Beyond birth, certain solvents can transfer to the newborn through breast milk. Studies have found that specific solvents including acetone, ethanol, isopropanol, toluene, and xylenes have been detected in low concentrations in the breast milk of exposed mothers (Natural Resources Defense Council, 2005). It is not expected that these chemicals accumulate in the nursing mother over time, but rather that they remain in the milk upon exposure through the point in time when the mother's body has eliminated them. Study of solvents in breast milk has been limited, as their short-lived nature requires immediate testing prior to evaporation. Results of some studies only indicate the presence of certain solvents in breast milk, but lack information relevant to concentration levels, exposure levels, or time trends (ibid). The studies that have occurred act as a reminder that nursing mothers should maintain the same level of caution when it comes to solvent exposure as pregnant women.

Chemical Protection for Pregnant Women

Studies on occupational reproductive toxins to date may be incomplete, but many demonstrate the potential danger certain chemicals can pose to humans. Lists of potential teratogens and mutagens exist, such as *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity* by the State of California EPA (2008), and University of Maryland's *Partial List of Teratogens* (1995). These lists contain chemicals familiar to conservators: acetone, arsenic, ethanol, isopropanol, lead, mercury, methyl methacrylates, odorless mineral spirits, titanium, toluene, and xylenes. However, these lists are useful only as general warnings about chemicals, since they do not take into account exposure levels or frequency, according to Dr. Anthony R. Scialli, M.D., Director of the Reproductive Toxicology Center. Relying on these lists to determine chemical risk is therefore not advisable. See "How to Determine your Chemical Risk Factor" on page 3 for more information on determining risks.

Good industrial hygiene is important during preconception, pregnancy and beyond, as all chemicals have the potential to cause reproductive harm if the exposure level is high enough through infertility, miscarriage, teratogenic and mutagenic effects on a fetus. Experts state that if a woman has good industrial hygiene when not pregnant, she should not have to alter her working habits much upon becoming pregnant (Scialli, July 2, 2012). Some employers, however, may put more restrictive procedures in place, so it is important to speak with your employer and/or safety professional on staff. For example, PPE such as lab coats, gloves, respirators and dust masks should be used as appropriate at all times when working with chemicals—pregnant or not. Furthermore, following the directions for proper use of PPE is crucial, including proper sizing, which can change over the course of a pregnancy. Although there is some disagreement among H & S professionals, respirator use does not need to be limited if pregnant, as adequate oxygen will flow through the mask if used as directed (Scialli, ibid). Frequent hand washing, proper storage of chemicals in sealed containers, not eating or drinking in the lab, and good ventilation are also important (CDC 1999, 16-17). Food, beverages, and street clothes should be stored in a separate area of the workplace, and contaminated items should not be brought home (CDC 1996). When possible, chemical exposure should be minimized, but this should be the goal even when pregnancy is not a factor.

Other Occupational Hazards

We quickly identify solvent exposure as a risk factor for conservators during pregnancy, but there are a number of other materials and tools used in conservation that may be occupational hazards and should be especially noted during pregnancy. For example, checking the Material Safety Data Sheets (MSDS) for hazard information and necessary safety precautions for products such as two-part epoxies, oxidizers, resins, or fill materials is an important step in evaluating materials safety, and may reveal chemical risks that specifically apply to pregnancy.

Pregnancy-induced reduction in flexibility and ease of movement may make ordinary procedures a challenge, including such tasks as climbing on a step stool for photography, reaching all portions of a larger artifact or painting or performing exhibit maintenance. Guidelines advising pregnant women not to lift more than 25 lbs. or perform repetitive lifting are more for the safety of the mother, as her connective tissues and womb structure are more susceptible to injury. Pregnancy hormones soften the mother's tendons, ligaments and connective tissues to prepare for childbirth, making the mother more susceptible to strain and injury. It is also important to remember that as a pregnant woman's body changes, her center of gravity shifts, which can lead to a greater risk for loss of equilibrium (Paul et al. 1994). This indicates that work on an elevated surface, such as a step stool or ladder should be done with great care during pregnancy and avoided entirely if possible in the third trimester.

Worker Task Modifications during Pregnancy

The following is a list of pregnancy job modifications suggested in Workplace Hazards to Reproductive and Development: A Resource for Workers, Employers, Health Care Providers, and Health and Safety Personnel (Drozdowsk and Whittaker 1999, 1). www.lni.wa.gov/Safety/Research/files/reprosumm.pdf

Job modifications to help make the pregnant worker more comfortable:

Problem	Possible Solution
Lower back pain	Provide a work surface suitable for sitting or standing. This could include a high chair and a high workbench. The ability to select the height of the work surface minimizes changes in posture that may lead to musculoskeletal complaints. Provide a chair with a backrest to support the lumbar and sacral areas. Provide a footrest to reduce pressure. Provide a step stool to elevate one foot while standing, reducing back sway.
Edema	Allow short breaks each hour so that the worker can stretch and walk. Modify work position by providing an adjustable chair or workstation.
Standing	Allow short breaks each hour so that the worker can stretch and walk. Modify work position by allowing periodic horizontal positions (raise legs, recline back).
Increased frequency of urination	Sufficient opportunities for bathroom breaks are very important for the comfort of the woman.
Hunger and nausea	The hunger and nausea experienced by pregnant women may be reduced by allowing a few minutes for a snack. In addition, failure to take in enough calories may prevent proper weight gain by mother and fetus.
Fatigue	Make sure the workstation fits the worker. Decrease workloads or increase work breaks.

Radiation Risks

Conservators working with equipment that generates radiation, such as x-rays and x-ray fluorescence (XRF), may wonder about the effects of radiation exposure to the fetus and how much radiation is too much. Procedures not associated with ionizing radiation, such as ultrasounds (acoustic) and magnetic resonance imaging (magnetic and radiofrequency) are relatively safe to be used during pregnancy. Although many studies state that ionizing radiation, such as that emitted from x-rays, during pregnancy can increase the risk of childhood cancers, a single diagnostic x-ray procedure will not result in harm to the fetus (American College of Obstetricians and Gynecologists, 2004). The Centers for Disease Control (CDC) states that if a fetus is exposed to the equivalent of 500 chest x-rays at one time, his or her lifetime cancer risk will be slightly higher than normal (less than 2% more than the average cancer risk of 40 to 50%) (CDC 2011). The pregnancy stage at which the fetus is exposed to radiation has important implications for the developmental results of the exposure. The time of highest concern for radiation exposure is actually the first two weeks of pregnancy. During that time damage to even one cell can cause death of the embryo, which at that point is only composed of a few cells (ibid). However, there is little risk of birth defects due to this exposure if the fetus survives radiation at this stage. High radiation exposure, defined here as greater than the dose received from 1000 chest x-rays, between 9 and 15 weeks of pregnancy can cause birth defects to the brain. Radiation risks to fetuses in the 18-to-25-week stage of growth must be extremely high (more than 5000 chest x-rays at one time, which far exceeds any normal dose of x-radiation unless it is a cancer treatment) to have any damaging effect. After the 26th week of pregnancy the fetus is no more sensitive to radiation than a newborn would be.

The safest way to handle radiation while pregnant is to avoid it, but this is not always possible. If you need to use a source of radiation while pregnant, first consult your designated Radiation Safety Officer to determine the safest possible way to use your equipment. Not all radiation sources and equipment are the same, so blanket safety advice cannot be offered. The three basic principles of radiation safety can be evaluated to minimize your exposure: length of time of exposure, distance from the radiation source, and shielding from the radiation energy. Be sure to wear dosimetry badges and have them read regularly, and ask to have them read if you feel that you have been exposed. Also use a Geiger counter to monitor individual real time exposure.

It is common for science laboratories that use x-radiography to request the submission of a "declaration of pregnancy." This is to inform the employer and lab manager that a reduction in radiation dose is required for the length of the pregnancy. Examples of these declaration letters can be found online at www.research.ucsf.edu/Forms/Eform-R002.pdf.

Guidelines for Radiation Exposure during Pregnancy

The United States Nuclear Regulatory Commission Guideline 8.36 for pregnancy exposure in the workplace for a declared pregnant woman is one-tenth that of an average adult worker (http://pbadupws.nrc.gov/docs/ML0037/ML003739548.pdf). The pregnant female is limited to 0.5 rem (5 millisieverts (mSv)) during a nine-month pregnancy whereas a regular worker is limited to 5 rems (50 mSv) in a year. For a frame of reference, an intraoral dental x-ray has an exposure of 0.005 mSv, while a chest x-ray is an exposure of 0.1 mSv (American College of Radiology, RadiationInfo.org).

Employers' Responsibilities and Workers' Rights

With exception to a declaration of pregnancy for workers using radiation equipment as described above, there is no rule about when to tell an employer that you are pregnant. Common practice to wait for the end of the first trimester when the risk of miscarriage is greatly reduced may not be prudent in conservation because extra safety precautions may be necessary during the important first few weeks of fetal development. Pre-conception is a good time to educate yourself on your rights and your employer's responsibilities so you can have a productive conversation about your needs and ensure that all safety precautions are being met. Often overlooked are the valuable and confidential resources

provided by a health and safety or consulting medical office associated with your workplace. These professionals are especially useful during early pregnancy when a woman may not be comfortable discussing her condition with a supervisor. It is crucial during this period to seek advice from an on-site health/medical office to develop a prudent occupational safety plan so that they can eventually (with permission) advocate on your behalf.

Most pregnancies are uncomplicated and, while there are certainly implications for normal work practices, many women are able to continue their duties with minimal interruption or revision. Following recommended accommodations like those suggested above for common discomforts may keep pregnant women working comfortably and productively farther into their pregnancy.

Since pregnancy is seen as the result of a normally functioning reproductive system, it is not a condition that is covered by the Americans with Disabilities Act (ADA). However, some pregnancy-related conditions such as gestational diabetes or preeclampsia, although transitory and non-chronic, may be considered to fall under the ADA and require an employer "to provide a reasonable accommodation (such as leave or modifications that enable an employee to perform her job) for a disability related to pregnancy, absent undue hardship (significant difficulty or expense)" (U.S. Equal Employment Opportunity Commission, website www.eeoc.gov/laws/types/pregnancy.cfm).

Most concerns fall under the Pregnancy Discrimination Act (PDA) which "forbids discrimination based on pregnancy when it comes to any aspect of employment, including hiring, firing, pay, job assignments, promotions, layoff, training, fringe benefits, such as leave and health insurance, and any other term or condition of employment" (ibid). Under the PDA, an employer must afford pregnant workers the same rights as other workers who might be temporarily disabled. An employer may not single out pregnancy-related conditions for special procedures to determine an employee's ability to work. However, if an employer requires a doctor's statement concerning an employee's ability to work before granting leave or paying sick benefits, this would apply to employees affected by pregnancy-related conditions as well.

OSHA Requirements

The Occupational Safety and Health Act of 1970 (OSH Act) was passed to ensure that all workers have the right to a safe workplace. The standards for a safe workplace do not become more stringent for workers who are pregnant or planning to conceive, as the permissible exposure limit (PEL) of chemicals over an 8-hour workday is applicable to all employees—including workers who may be pregnant. If a laboratory or studio is following safe work practices, there is no legal obligation to enact other measures. Employers must remember that in addition to ensuring that workers are not exposed to hazardous chemicals, obligations to comply with OSHA's Hazard Communication Standard (29 CFR 1910.1200) also apply. This standard requires employers to provide information to their employees about the hazardous chemicals to which they are exposed. In accordance with this standard, employers must: establish a hazard communication program [29 CFR 1910.1200(e)]; make labeling and MSDS available to employees [29 CFR 1910.1200(f) and (g), respectively]; and provide for employee training [29 CFR 1910.1200(h)] (www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27017). Following the standard should make it easier for pregnant employees and their employers to review MSDSs for the chemicals they use and determine whether those chemicals present reproductive or pregnancy-related hazards.

If there is a documented occupational exposure, other regulations may come into effect. For instance, when there has been exposure to inorganic lead, physicians may have "broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk" (1926.62 App C - Medical Surveillance Guidelines. www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10644).

Workers' Rights Beyond Pregnancy

Following return to work after giving birth, employees should be aware that the Patient Protection and Affordable Care Act ("Affordable Care Act") requires employers "to provide reasonable break time for an employee to express breast milk for her nursing child for one year after the child's birth" (United States Department of Labor, www.dol.gov/whd/nursingmothers). The employer must also provide a private and safe location for this activity that is not a bathroom. For more information on legal rights for nursing mothers, see the web resources below.

Clinical Risk Assessment

It is important to view chemical and occupational safety during pregnancy as a process that involves the educated participation of the employee, employer, physician and, when available, company safety office or medical office. Documenting known "hazards and reducing these risks by safe work practices, personal protective clothing, and a reduced use of toxic materials can be effective and easily practiced" (Feinberg and Kelley 1998, 90). However, not all OB/GYNs have the required experience to help a patient do a proper clinical risk assessment. Evaluating a healthcare provider's experience in this area may be something to consider when interviewing a doctor who will provide care through a pregnancy.

Conclusion

Everything is toxic at high enough doses—even drinking water. Reproductive toxicity is difficult to assess, as myriad factors involved in each pregnancy can skew the outcome. The goal of all workers involved with any chemicals should be to limit exposure as much as possible, regardless of their reproductive status. On an individual level, an employee's best protection is to use good working practices and follow good industrial hygiene all the time, not just when pregnant. This means always wear appropriate PPE (gloves, respirators, dust masks, lab coats, etc.) and to be mindful in removing and laundering exposed clothing frequently. Pregnancy should not require special care if your normal practices are up to OSHA standards and

you use PPE properly as instructed. Additionally, OSHA's personal exposure limits (PEL) for chemicals in the workplace are generally set to fall below a level that would result in adverse symptoms of exposure. If symptoms listed on an MSDS are experienced, it should be assumed that the PEL has been reached and/or surpassed.

On a larger scale, employers are responsible for creating as hazard-free a workplace as is possible. Many reproductive toxicants are also carcinogens and/or cause other general health effects such as dermatitis, liver toxicity, and neurologic abnormalities (Paul and Himmelstein, 1988). Providing a safe workplace means requiring all workers to take appropriate measures to protect themselves, as these measures will also protect those around them. Some examples include using the fume hood or extraction trunks when decanting solvents and ensuring proper encasement of areas where lead is being disrupted. Fostering an environment that emphasizes good industrial hygiene helps protect everyone in the workplace.

The onus is often on employees to protect and isolate themselves from reproductive risks, whether from chemicals or other occupational hazards. This is especially true if an employee opts to wait until the second trimester to declare a pregnancy. Experts, however, advise that it is important for pregnant conservators to keep their risks in perspective. While lab safety is crucial, basic precautions such as taking folic acid daily and abstaining from drinking alcohol or smoking before and during pregnancy are critical (Scialli, personal correspondence, July 11, 2012). AIC's Health and Safety Committee hopes that this article serves to inform conservators about the chemical and occupational reproductive hazards in the field, and that it sparks a dialogue between employers and employees about creating a safe workplace.

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Web Resources

For additional information, check out other Health & Safety resources on the AIC wiki, AIC website, and AIC News:

AIC Health & Safety Webpage

www.conservation-us.org/Health and Safety

AIC Wiki

Heavy Metals, their Salts, and other Compounds
www.conservation-wiki.com/index.php?title=HS_Heavy_Metals,_their_Salts,_and_other_Compounds
Fall Protection; Working Safely at Heights www.conservation-wiki.com/index.php?title=HS_Fall_Protection;_Working_Safely_at_Heights
A Conservator's Guide to Respiratory Protection
http://www.conservation-wiki.com/w/index.php?title=HS_A_Conservator%27s_Guide_to_Respiratory_Protection

AIC News

"OSHA Updates Standards for Personal Protection"
January 2010 (35:1) 14–15
"Your Workstation: is it Working for You?" May 2007 (32:3) 16–17
"Does a Woman's Solvent Exposure Affect her Offspring? Summary of a Recent Study" May 2005 (30:3) 18–19

Annotated List of Web Resources

(all sites accessed 7/2012)

Organization of Teratology Information Specialists (OTIS)
www.Otispregnancy.org
OTIS is a non-profit organization dedicated to providing accurate evidence-based, clinical information to patients and health care professionals about exposures during pregnancy and lactation. Pregnant or nursing mothers can call their toll-free number for free advice or questions about chemical exposures during pregnancy and lactation.

Reproductive Toxicology Center (REPROTOX)
www.ReproTox.org
REPROTOX is an information system on environmental hazards to human reproduction and development that provides summaries on the effects of medications, chemicals, infections, and physical agents on pregnancy, reproduction, and development. REPROTOX requires a membership purchase for access to all materials.

"If I'm Pregnant, Can the Chemicals I Work With Harm My Baby?"
www.cdph.ca.gov/programs/hesis/Documents/pregnant.pdf
This online pdf document from the Hazard Evaluation System and Information Service of California's Department of Health Services explains how to reduce exposure and provides a useful worksheet to document potential chemical exposure so that you can discuss the information with an appropriate health professional and begin to determine what appropriate steps will be necessary to reduce exposure.

Technical Bulletin: Radiation Safety Considerations for the Declared Pregnant Woman
www.rss.usda.gov/publications/decpreg.htm
The Nuclear Regulatory Commission's Standards for Protection Against Radiation (10 CFR Part 20) require that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv). This dose is ten times lower than the occupational dose allowed for the standard radiation worker. This document from the United States Department of Agriculture, Office of Human Resources Management—Safety and Health Management Division, Radiation Safety Staff describes how to implement a program that satisfies this safety requirement for individuals working with radioactive materials or x-ray producing equipment.

Occupational Safety & Health Administration (OSHA) of the U.S. Department of Labor
www.osha.gov/law-regs.html
Under the 1970 Occupational Safety & Health Act, employers are responsible for providing a safe and healthful workplace. OSHA's mission is to assure safe and healthful workplaces by setting and enforcing standards, and by providing training, outreach, education, and assistance. OSHA's Law and Regulations page contains links to all current OSHA standards, provides information on the rulemaking process used to develop workplace health and safety standards, and includes links to all Federal Register notices that are currently open for comment. This page also provides links to the OSH Act and other relevant laws.

www.osha.gov/workers.html
Workers are entitled to working conditions that do not pose a risk of serious harm. This page on the OSHA website details workers rights and what OSHA can do to help.

www.osha.gov/SLTC/hazardoustoxicsubstances/index.html
This page has a compilation of useful web resources including links organized in the following groups: OSHA Standards, Hazard Recognition, Specific Chemical Information, Possible Solutions, and Additional Information.

The Job Accommodation Network (JAN)
https://askjan.org/bulletins/adaaa1.htm
The JAN website is a service of the Office of Disability Employment Policy, U.S. Department of Labor. The site explains the ADA Amendments Acts of 2008. For a list of state agencies that provide information regarding state discrimination laws, visit: http://askjan.org/cgi-win/TypeQuery.exe?037

The U.S. Equal Employment Opportunity Commission
The U.S. Equal Employment Opportunity Commission website has a full explanation of the Pregnancy Discrimination Act (PDA). www.eeoc.gov/laws/types/pregnancy.cfm and Facts about Pregnancy Discrimination www.eeoc.gov/facts/fs-preg.html

Break Time for Nursing Mothers
www.dol.gov/whd/nursingmothers/
As of March 2010, nursing mothers have a right to certain workplace accommodations for one year following birth. More information is available through the Wage and Hour Division page on the U.S. Department of Labor website.