

Can my pregnant patient keep her job at the NAIL SALON?

Nail salon employees work with products that contain harmful chemicals. Nail salon workers can reduce their exposure to the chemicals that may cause reproductive harm. This fact sheet offers guidance on how to reduce your patient's exposure to chemicals. These strategies will help your pregnant patient protect her health, her pregnancy and her job.

What does a nail salon technician/manicurist do and what chemicals are in the products they use?

Manicures and Pedicures: When nail salon workers remove old polish from their client's nails they use a variety of solvents, including **acetone**. After cutting back the cuticle and shaping the nail, they may apply a base coat, a color coat and a top coat; these products also contain a mixture of solvents, including **toluene**, **acetone** and **ethyl/butyl acetate**. These solvents are mixed with resins that harden. The resins may contain **formaldehyde** or **dibutyl phthalate**.

Artificial nails: There are many types of artificial nail systems. All of the systems are made with some type of **acrylic resin**.

Acrylic and Gel nails: Nail salon technicians create acrylic and gel nails on top of removable forms. After they apply a coat of primer (**methacrylic acid**) to their client's nails they bond the removable forms to the tips of their natural nails with a nail adhesive (**cyanoacrylate**). When salon workers do acrylic nails they brush a liquid monomer (**methyl-** or **ethyl methacrylate**) and a powdered polymer onto the forms. When they do gel nails they brush a thick **gel acrylic** onto the forms. Acrylic nails air dry, gel nails dry under an ultraviolet light. After acrylic or gel nails harden, they remove the forms with a grinding tool.

Tips: When salon workers do "tips" they glue pre-formed plastic nails onto their client's nails with a nail adhesive. They fill the nails with a coat of gel acrylic or nail adhesive.

Wraps or "linen strips": When salon workers do "wraps" or "linen strips" they glue layers of fiberglass, silk or linen onto their client's nails with a nail adhesive. They coat these layers with gel acrylic or nail adhesive.

Your patient may be exposed to these chemicals if they get onto her skin or if she breathes the vapors. When filing nails, she may breathe in dust that contains these chemicals. **Not all nail salon products contain the chemicals listed above. Ask your patients for the products' Material Safety Data Sheets (MSDSs) for specific information on the chemicals used in their salons.**

What are the reproductive hazards of the chemicals used in nail salons ?

Very few studies have been done on prenatal exposure to nail care products. The degree of exposure is likely to vary for each person and will depend on the amount of material being used, the frequency of use and the worksite's ventilation system. The reproductive risk of working with nail care products also depends on the trimester of the pregnancy. As discussed above, the main exposures to consider in this work are: **solvents** (especially **acetone**, **toluene**, and **formaldehyde**), acrylates such as **methyl methacrylate** and **ethyl methacrylate**, and **phthalates**.

Solvents such as acetone can affect pregnancy at higher airborne levels. Exposure early in pregnancy has been associated with miscarriage in other settings such as laboratory work, although results of studies are conflicting. Solvents can act on the developing nervous system of the fetus, producing abnormalities analogous to the "fetal alcohol syndrome" including craniofacial abnormalities and learning deficits. In animals, prolonged or high-level exposure to various organic solvents has been associated with an increased rate of birth defects or behavioral problems.

Acrylates can cause allergic and irritant respiratory and skin disorders in humans. Because these products have been associated with asthma, workers may need to use or increase their use of anti-asthmatic medicines. The risks of increasing use of anti-asthmatic medication should be weighed for pregnant patients on an individual basis. There are no studies which specifically examine human acrylate exposures in pregnancy. Two studies of women who work in the plastics industry (which involves many chemicals, not just acrylates) published conflicting data on the association between this work and miscarriages. Animal studies do not suggest that acrylate exposures at the levels encountered in nail salon work would significantly increase the risk for birth defects above the general background risk for birth defects.

Phthalates There is very little information on human reproductive problems from exposure to phthalates. Their principal effects have been noted in men as a possible endocrine-disrupting chemical, potentially associated with low sperm counts or abnormal male fecundity. Human epidemiological evidence for reproductive harm from phthalates is very limited. Phthalate exposure *may* be associated with miscarriage, or shorter gestation. However, further studies are needed prior to confirming these associations. Animal toxicologic studies suggest the possibility of some types of birth defects, including: neural tube defects, clubfeet, decreases in fetal weights, and genitourinary defects in male offspring. Because these were seen at doses in excess of typical salon worker exposures, the significance of these animal findings for humans is not known.

If exposures are controlled, your patient should be able to continue working

In general, at the low air levels that have been measured in most nail salons, the chemicals are not likely to cause a problem to the pregnancy. However, so that you can be as protective of your patient and her pregnancy, while allowing her to work while pregnant, we recommend that the use of these chemicals be reduced to levels that are **as low as possible** through the use of proper work practices and controls. Tips to accomplish this are discussed on the following page.

How can you determine if a nail salon's chemical exposures have been controlled to levels that are as low as possible?

Nail salons frequently have a chemical smell. Some chemicals cause harm before they can be smelled. Other chemicals can be smelled well before they represent a hazard. For this reason, a salon's chemical odor can not be used to determine if the salon is safe for your patient. The best approaches to controlling exposures in nail salons are discussed below.

❖ The salon should have fresh air.

If there are windows in the salon, they could be kept open. The salon should check to make sure that the proper amount of fresh outside air per person is brought into the building. The minimum recommended amount is 25 cubic feet per minute of fresh air per occupant.

Small table fans do not improve the ventilation in a salon because they do not direct the dust and vapors out of the work area. In general, air purifiers don't work either.

❖ The salon could use manicure tables that have a built-in ventilation system.

Some manicure tables are made with ventilation systems built into them. Ventilation systems pull dusts and vapors away from the nail technician and the client. Ideally this air should be exhausted out of the building. If charcoal and high efficiency filters are used they should be changed routinely.

❖ The salon should cover the trash and product containers.

Materials soaked in solvent or acrylic residue should be discarded in covered containers.

❖ Salon workers may be able to protect themselves from dust exposure by wearing disposable "dust masks" such as mask called an "N95".

Dust masks are available at safety supply or hardware stores. Dust masks may offer some protection when your patients file or grind nails but they won't protect your patient from solvent vapors. Charcoal dust masks can be used to remove solvent odors. When your patients select a dust mask they should make sure it fits, some masks may be too big.

Caution: Surgical masks do not offer protection because they do not provide a seal around the face.

❖ Salon workers can protect their skin from dust exposure by wearing disposable gloves. No glove provides a perfect barrier so your patient should wash their hands several times a day with mild soap.

❖ The salon should not use products that contain liquid methyl methacrylate (MMA)

The Food and Drug Administration (FDA) has stated that liquid methyl methacrylate is a "poisonous and deleterious substance that should not be used in fingernail preparations". Your patient's salon may be using MMA if their clients' artificial nails are very hard to remove and if the salon's prices are substantially cheaper for a full set of artificial nails.

In addition to avoiding the use of MMA, your patient's salon could use polish removers without acetone and nail polishes without toluene, formaldehyde and phthalates.

❖ Eating, drinking and smoking should not be permitted in the work area.

❖ The salon should provide its workers with training on chemicals in the workplace.

The information in this pamphlet is intended for general reference purposes only and is not intended to address specific medical conditions. Readers are encouraged to confirm the information contained herein with other sources. It is not the intention of these factsheets to provide specific medical advice, but rather to provide users with information to better understand workplace exposures. This information is not intended to be used as a substitute for professional medical advice or a medical exam.

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**For additional information please contact the
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