

GLOSSED OVER



- Health Hazards Associated with
- Toxic Exposure in Nail Salons



A REPORT BY WOMEN'S VOICES FOR THE EARTH **WVE**

Toxic Exposure at Nail Salons

A look at the health hazards associated with toxic exposure in nail salons and recommendations for improving conditions for nail salon employees and customers.

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WVE WOMEN'S VOICES FOR THE EARTH



IS THERE A HEALTH RISK FROM TOXIC EXPOSURE AT NAIL SALONS?

It is well-known that nail salon products contain toxic chemicals, such as phthalates, toluene, formaldehyde, acetone, methylacrylates and other volatile organic compounds. The health effects of exposure to these chemicals on women day after day, particularly women of childbearing age, are not fully understood. Incredibly, despite the toxic nature of the chemicals, the potential for exposure in poorly ventilated workspaces, and the large population of women exposed, little epidemiological or occupational health research has been conducted on nail salon workers. Because nail salons are open to the public and cosmetics are presumed to be harmless, it has been assumed that these workplaces are safe and healthy.

The reality is that there has been very little research examining actual effects on workers to substantiate that assumption. The few preliminary studies that have been conducted indicate a cause for concern both for customers, and to a greater extent for the health of female nail salon employees. Occupational health studies have shown significantly increased adverse health outcomes, such as decreased attention and processing skills, as well as occupational asthma in nail salon workers as compared to control subjects. Factors such as poorly labeled products, limited available safety information, small workplaces and inadequate ventilation all serve to exacerbate the effects of toxic exposure in nail salons. Unfortunately, current regulation and enforcement is wholly inadequate to protect nail salon workers from potential exposure. This report will outline several of the main health hazards associated with toxic exposure in nail salons and provide recommendations for improving conditions for all nail salon employees and customers.

DEMOGRAPHICS OF THE NAIL SALON INDUSTRY: WHO'S BEING AFFECTED?



According to NAILS magazine, in 2005 there were over 57,000 nail salons in the U.S. employing over 380,000 licensed nail technicians. The vast majority (95%) of these employees are women. Nail technicians are also predominately women of color (59%). The largest ethnic group represented are Vietnamese women who comprise 38% of nail technicians country-wide. The average age of nail technicians is 38, and the average length of time spent in the nail industry is 8.6 years. Customers at nail salons are also predominately women, comprising 94% of all customers.¹ The nail salon industry has experienced tremendous growth in the last 10 years, with an increase of 374% in the number of salons and an increase of 327% in the number of nail technicians.² These demographic trends in the industry have profound impacts. For one, women of childbearing age are especially vulnerable to even low levels of toxic exposure, due to the potential impacts on a developing child. Many technicians are also at risk due to the common problem of a language barrier. Women do not have to be fluent in English to become licensed technicians, yet important safety information is usually not available in the language they can read. This is especially true among the Vietnamese population.

A survey conducted by Environmental Working Group in 2005 found eight brands of nail products contained formaldehyde, five contained formaldehyde resin, 37 contained toluene, and 89 contained dibutyl phthalate.

Toxic Hazards in the Nail Salon:

Three top ingredients of concern in many nail products are toluene, formaldehyde and dibutyl phthalate (DBP) which have been linked to both reproductive harm and cancer. A survey conducted by Environmental Working Group in 2005 found eight brands of nail products contained formaldehyde, five contained formaldehyde resin, 37 contained toluene, and 89 contained dibutyl phthalate.

Toluene. Toluene is a clear colorless liquid that acts as a solvent. It is found in many nail products, as it helps suspend the pigment throughout the liquid and helps form the smooth finish across the nail. Toluene is volatile and evaporates into the air as nail polish dries. Exposure to toluene can affect the central nervous system with low level symptoms such as headache, dizziness, and fatigue. Toluene is also an irritant to the eyes, nose and throat.³

At very high exposures, toluene has been found to be toxic to the kidneys and liver, and is a possible reproductive or developmental toxin. Toluene can be transmitted through the placenta to a fetus, and can be transmitted through breastmilk.⁴ The most common route of exposure to toluene for adults is through inhalation, although dermal exposure is also possible.

Formaldehyde. Formaldehyde is an odiferous chemical commonly used in resins and as a preservative. It is found in some nail products as a nail hardener and to help create a smooth finish. Formaldehyde is an irritant to the eyes, nose and throat, and exposure can lead to coughing and wheezing. Repeated skin exposure can lead to skin irritation and an allergic rash called dermatitis. It is also a known human carcinogen.⁵ People are exposed to formaldehyde by breathing it in, although it can also be absorbed through the skin.

Dibutyl Phthalate. Dibutyl phthalate (DBP) is a chemical used in a variety of consumer products as a plasticizer. In personal care products it adds flexibility, a moisturizing sheen and helps dissolve other cosmetic ingredients.⁶ It has been commonly found in nail polish. DBP is a possible reproductive or developmental toxin. Phthalate exposure occurs through inhalation, absorption through skin and ingestion in food.

Other Toxic Compounds. A myriad of other toxic compounds are associated with nail salons. Several strong solvents such as acetone and alcohols are used to remove nail polish. Exposure to these solvents can lead to nose, throat, lung, skin and eye irritation, as well as headaches, dizziness and confusion.

Acrylic nail application leads to exposure to nail dusts and acrylic polymers such as methyl methacrylate (MMA) and ethyl methacrylate (EMA). The FDA restricted the use of 100 percent MMA in nail products in the U.S. in 1974 due to its toxicity. It was replaced by the less toxic EMA. Anecdotal reports indicate that MMA may still be in use in some salons as it is a significantly less expensive chemical.⁷ Both EMA and MMA have a very strong odor even at low concentrations and are irritating to the eyes and respiratory system. They are also sensitizers, which means that people exposed over time can become allergic with reactions that include asthma and dermatitis.⁸



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TOXIC EXPOSURE AND HARM IN THE NAIL SALON



Air Monitoring in Salons

While published studies quantifying toxic exposure in nail salons are relatively few in number, the chemicals discussed above, toluene, formaldehyde, dibutyl phthalate, acetone, ethanol and acrylic dusts and vapors have all been detected by air monitoring in salons. The levels have generally been found to be much lower than the existing exposure standards for each chemical.^{9,10,11,12} While these standards, such as the Occupational Safety and Health (OSHA) Permissible Exposure Limits (PELs), are considered “safe” from a regulatory standpoint, they have serious limitations in protecting health. These standards were created in the 1960’s for industrial settings with an intent to protect against severe acute exposures. Most OSHA PELs do not take into consideration the effects of a combination of multiple chemicals, or the long term chronic effects of exposure on endpoints such as asthma, cancer or reproductive harm. In addition, these limits are restricted to inhalation exposure and do not account for absorption through the skin, which is a potential route of exposure for nail salon workers.

In one study, nail technicians were found to have greater problems with attention and cognitive processing, and reduced sense of smell than control subjects.

Health Studies of Nail Salon Workers

A few studies have been conducted to assess health outcomes in nail salon workers. While these studies are unable to specify which of the myriad chemicals (or more likely, what combination) may be linked to each of the health outcomes, the results of these studies indicate that exposure in nail salons appears to be hazardous. In one study, nail technicians were found to have greater problems with attention and cognitive processing, and lesser sense of smell than control subjects. Length of time worked in the industry as well as having a smaller workplace and inadequate ventilation was associated with greater severity of these symptoms.¹³ Another study looked at self-reported cognitive symptoms in nail salon workers. The findings show that nail salon workers had greater complaints about memory and learning. Again, this study showed that smaller workplaces and inadequate ventilation increased the severity of complaints.¹⁴ A third study in Colorado found six physician-diagnosed cases of occupational asthma in nail technicians who applied acrylic nails. It was demonstrated that a manicure table with built in downdraft ventilation would significantly decrease exposure to acrylic nail dusts and ethyl methacrylate by nail technicians.¹⁵ The risk of spontaneous abortion was the focus of a study of cosmetologists in

North Carolina. This study found an increased risk of spontaneous abortion among cosmetologists in salons where manicuring or “nail sculpturing” was performed.¹⁶

There is sufficient concern about the long term health effects of low level chemical exposure in nail salons. However, no studies on nail salon workers examining chronic health effects such as birth defects, infertility or reproductive harm have been published. One study looking at occupational causes of cancer found that cosmetologists were at higher risk for Hodgkin’s disease. The study did not distinguish nail salon workers from other cosmetologists such as hairdressers or beauticians, so the specific impacts of nail salon chemicals cannot be determined by this study.¹⁷



Photo courtesy Tony Moore.

Self-reported Health Effects and Concern About Occupational Health Hazards

Additional studies have been conducted that document nail technicians’ self-reported health effects in nail salons. An unpublished survey of Vietnamese nail technicians in Boston found considerable awareness that their occupation was affecting their health. A majority of those surveyed responded that there were odors at work that make them feel bad, and they identified these odors as associated with artificial nail liquids. Survey respondents also reported experiencing work-related headaches, skin problems, and respiratory problems. Many of the technicians reported that these symptoms improved when they were away from work for a day or two. Very few of the respondents, however, reported that their employers had provided any information about health hazards of nail salon work.¹⁸

An analysis of calls to a California occupational hazard hotline demonstrated that nail salon workers are concerned about the impacts of their work on their health, particularly as it relates to effects on pregnancy. The analysis found that manicurists and cosmetologists were the third largest occupational sector to make pregnancy-related inquiries to the hotline. The chemical most often asked about by manicurists were acrylates (artificial nail liquids).¹⁹ The National Asian Pacific American Women’s Forum reports that Asian-American nail workers often feel powerless to change their work environments, and resistant to reporting the situation to occupational health authorities. Many Asian-American nail workers report that they simply quit their jobs when they get pregnant to avoid health impacts from exposure.²⁰



Photo courtesy of Angie Muddowney.

Failures of Regulation and Enforcement to Protect Health of Nail Salon Workers

The question remains—if we know that hazardous chemicals are present in nail products, that these chemicals can be detected in the air of nail salons, that nail salon workers are reporting adverse health outcomes likely due to exposure, and we know that nail salon workers have expressed concern about their health, especially during pregnancy—why isn't the law protecting women from this preventable exposure?



Lack of Regulation on Ingredients in Products

By law, nail products sold in the United States must be free of poisonous or deleterious substances that might harm users under conditions of normal use. However, the federal Food and Drug Administration (FDA) admits that it “does not review or approve nail products and other cosmetics before they go on the market.” Instead the FDA relies on its “Cosmetics Voluntary Registration Program”, which allows cosmetics manufacturers to voluntarily report to the FDA the adverse reactions that customers complain about, so that the FDA may then take legal action against the product.²¹ The FDA has admitted that the Food Drug and Cosmetics act contains no provisions that require evidence of the safety of ingredients in cosmetics product prior to their marketing. The FDA also recognizes the fact that it lacks the ability to require a recall of harmful products, and that recalls are voluntary company actions.²² In the absence of FDA control, cosmetics manufacturers have endeavored to police itself through an industry panel call the Cosmetics Ingredient Review (CIR). In its history thus far, this industry-funded panel has only managed to review 11% of all 10,500 ingredients found in cosmetics.²³



Access to Safety Information is Inadequate

Meanwhile at the local level, the responsibility for communicating occupational hazards to nail salon workers is predominately left up to manufacturers of products and employers. According to the Hazard Communication Standard, by law, manufacturers are required to provide material safety data sheets (MSDS) to their customers which outline safety information about hazardous chemicals in a product. Employers are required to explain these MSDSs to their employees and tell them about potential hazards linked to chemicals in nail products.

Unfortunately, there is little to no enforcement of the Hazard Communication Standard in the nail salon industry. Enforcement falls to inspectors with the Occupational Safety and Health Administration (OSHA) or, in some states, to State Boards of Cosmetology. Even between OSHA and the Boards of Cosmetology, there are not nearly enough inspectors to be able to visit each nail salon even once a year. For example, in California, there are only 15 inspectors in a jurisdiction containing over 9,000 salons²⁴. The result is that nail salon workers are rarely given adequate information about the chemical hazards in their workplace.



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WHAT MUST BE DONE TO PROTECT THE HEALTH OF NAIL SALON WORKERS?



While the scientific data confirming long term significant harm to the health of nail salon workers may still be wanting, it is evident that nail salon workers today are unnecessarily exposed to toxic chemicals in the workplace. This exposure has been linked to acute health effects such as dizziness, headaches, irritation and respiratory disease. Comprehensive research on long-term effects is certainly needed, but in the meantime, a precautionary approach must be taken to reduce or eliminate this unnecessary harmful exposure to the thousands of young women employed in the nail salon industry.

Recommendations:

The following recommendations can help alleviate this toxic exposure.

In the short term:

A) Reformulate Nail Salon Products to Eliminate Toxic Ingredients. Many of the toxic ingredients of concern in products used in nail salons are unnecessary to the performance of the product. These toxic ingredients can and should be removed by manufacturers where non-toxic alternatives are available. For example, major nail polish manufacturers OPI and Sally Hansen have taken the lead by reformulating their nail polishes

to be free of dibutyl phthalate, toluene, and formaldehyde. Several other manufacturers have chosen to at least remove dibutyl phthalate from their polishes. The Campaign for Safe Cosmetics manages a list of companies that have signed the “Compact for Safe Cosmetics”—a voluntary pledge to remove and replace harmful ingredients in their products with safer alternatives.





B) Provide Nail Salon Technicians With Better Safety Information on Toxic Exposure.

Nail salon technicians should be provided with better safety information, that is understandable, available in multiple languages, and expresses the urgency and seriousness of avoiding toxic exposure in the salon. There are several important ways this information can be disseminated.

1) Label nail salon products more comprehensively to disclose the ingredients and warn users of their toxic nature. Some progress has been made toward this in California which recently passed legislation that

requires cosmetics manufacturers to disclose to the state if their products contain carcinogenic chemicals. 2) Incorporate safety information into the process to become a licensed nail technician. Licensing exams are generally administered by the state Boards of Cosmetology, and while they often require knowledge of infection control and prevention, the curricula rarely covers toxic exposure in the salon. 3) Make safety fact sheets readily available, in multiple languages, for nail salon owners to provide to their employees.

C) Improve Ventilation in Nail Salons.

Inadequate ventilation can lead to significantly increased levels of toxic chemicals in the ambient air of salons. Improved ventilation in nail salons should be encouraged. The Toxics Use Reduction Institute in Massachusetts developed recommendations on methods and standards for appropriate ventilation in nail salons. This information, which has been disseminated to Massachusetts Board of Cosmetology inspectors, should be further disseminated nationwide. In addition, public/private partnerships and funding programs should be developed to assist owners in implementing improved ventilation in their salons.

In the long term:

D) Pass National Legislation to Prevent the Use of Toxic Chemicals in Cosmetic Products.

While voluntary actions by manufacturers is the first step, legislation must be passed to ban certain toxic chemicals from use in cosmetic products. The European Union has taken the lead on this with its Cosmetics Directive (76/768/EEC), which bans the use of chemicals that are known or strongly suspected of causing cancer, mutation or birth defects. Several other countries are following this lead with similar legislation. This legislation will need to be updated and reviewed as science develops over time, establishing which chemicals are determined to be harmful.

E) Give the Food and Drug Administration (FDA) the Authority to Regulate Cosmetic Ingredients.

The FDA does not currently have the authority to regulate ingredients in cosmetics. Nonetheless, it is the logical U.S. government agency to be authorized with this task.



F) Conduct More Research on Long Term Effects of Chronic Low-level Exposure to Chemicals Found in Nail Salons. As stated in this report, the number of published studies assessing the potential health effects of chemical exposure in nail salons is astonishingly low. New research can help more accurately identify risks, establish better prevention measures and improve health for thousands of nail salon employees and customers nationwide.

G) Develop Safer Chemicals for Use in Nail Products that Currently Have No Non-toxic Alternatives. Some nail salon products contain toxic ingredients that have essential functions for which there are currently no nontoxic alternatives. For these products, innovative research and green chemistry should be applied to find effective non-toxic alternatives which can be incorporated into the products. Cosmetics manufacturers should be encouraged to undertake this research to improve products for the future.

Contact information for groups and organizations working to reduce toxic exposure in nail salons:

Alliance for a Healthy Tomorrow:
www.healthytomorrow.org

Campaign for Safe Cosmetics:
www.safecosmetics.org

Community Coalition for Environmental Justice:
www.ccej.org

Environmental Coalition of South Seattle: ecoss.org

Toxics Use Reduction Institute (TURI):
www.turi.org

Pioneer Valley Project, Springfield, MA

Vietnamese Nail Care Professional Association:
www.vncpa.org

For A Better Bronx, Bronx, NY

NYCOSH: www.nycosh.org

Members of the California Healthy Nail Salon Collaborative

Asian Health Services: www.ahschc.org

Asian Law Caucus: www.asianlawcaucus.org

Asian Advocacy Project of Community Action Marin: www.camarin.org

Asian Communities for Reproductive Justice:
www.reproductivejustice.org

Breast Cancer Fund: www.breastcancerfund.org

Northern California Cancer Center:
www.nccc.org

Orange County Asian Pacific Islander Community Alliance: www.ocapica.org

National Asian Pacific American Women's Forum:
www.napawf.org

Environmental Finance Center, Region 9:
www.efc9.org

CA Dpt of Health Services, Environmental Health Investigations Branch: www.ehib.org

Physicians for Social Responsibility, Los Angeles:
www.psrla.org

Alameda County Health Care Services Agency, Public Health: www.acgov.org/health/

United Food and Commercial Workers, Local 5:
www.ufcw.org

California Department of Health Services, Occupational Health Branch, Hazard Evaluation System and Information Service:
www.dhs.ca.gov/ohb/HESIS/

U.S. Region 9 Environmental Protection Agency:
www.epa.gov/region9/

Women's Voices of the Earth:
www.womenandenvironment.org

1. NAILS Magazine (2006) NAILS Magazine 2005-2006 Big Book. Available at: www.nailsmag.com/resources/industryStats.aspx. August 28, 2006
2. Environmental Protection Agency, (2006) "About the Nail Salon Project" Available at: www.epa.gov/dfe/pubs/projects/salon/about.htm
3. HESIS (2005) "Toluene Fact Sheet." Hazard Evaluation System and Information Service. California Department of Health Services. Available at: www.dhs.ca.gov/ohb/HESIS/toluene.htm
4. Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. Available at: www.atsdr.cdc.gov/toxprofiles/tp56.html
5. OSHA (2002) "Formaldehyde Fact Sheet". Occupational Safety and Health Administration. Available at: www.osha.gov/OshDoc/data/General/Facts/formaldehyde-factsheet.pdf
6. HCWH (2002) Aggregate Exposures to Phthalates in Humans. Health Care Without Harm, July 2002.
7. NAILS (1997) "The MMA Controversy". NAILS Magazine, September 1997. Available at: www.beautytech.com/nailtech/mma2.htm
8. OHCOW (2005) Occupational Hazards in Nail Salons. Occupational Health Clinics for Ontario Workers Inc (OHCOW) 2005.
9. Labreche, F, et al (2003) Characterization of Chemical Exposures in Hairdressing Salons. Applied Occupational and Environmental Hygiene, 18: 1014-1021, 2003.
10. Ibid.
11. NIOSH (1992) Health Hazard Evaluation Report No. 92-128: Tina and Angela's Nail Salon, Springdale OH. NIOSH Hazards Evaluation and Technical Assistance Branch. July 1992.
12. NIOSH (1992) Health Hazard Evaluation Report No. 90-048: Haute Nails, Norman, OK. NIOSH Hazards Evaluation and Technical Assistance Branch. September 1992.
13. LoSasso GL (2002) Neurocognitive sequelae of exposure to organic solvents and (meth)acrylates among nail-studio technicians. Neuropsychiatry, Neuropsychology, & Behavioral Neurology. 15(1):44-55, March 2002.
14. LoSasso GL, et al (2001). Neuropsychological Symptoms Associated With Low-Level Exposure to Solvents and (Meth)acrylates Among Nail Technicians. Neuropsychiatry, Neuropsychology, & Behavioral Neurology. 14(3):183-189, July/September 2001.
15. Spencer A., et.al. (1997) Control of ethyl methacrylate exposures during the application of artificial fingernails. American Industrial Hygiene Association Journal. 58(3):214-8 March 1997.
16. Savitz, J et. al. (1994) Spontaneous abortions among cosmetologists. Epidemiology. Vol.5 No (2):147-55, 1994.
17. Robinson, C. et al (1999) Cancer mortality among women employed in fast-growing U.S. occupations. American Journal of Industrial Medicine. Vol 36:186-192, 1999.
18. Roelofs, C. et al (2006) Nail Salons: Health Effects and Work Environment Characteristics. Presented at the American Industrial Hygiene Conference, Chicago, IL May 17, 2006. Available at: www.aiha.org/aihce06/handouts/po125roelofs.pdf
19. Wright, C. et al (1989) Analysis of Pregnancy-Related Calls to an Occupational Hazard Hot Line. Western Journal of Medicine. Vol. 151, No. 6, December 1989. pp 670-675.
20. National Asian Pacific American Women's Forum (2006) "The Nail Salon Industry: The Impact of Environmental Toxins on API Women's Reproductive Health". May 2006 Available at: www.napawf.org/file/issues/issues-NailSalon.pdf
21. Kurtzweil, P (1995) "Fingernails: Looking Good While Playing Safe." FDA Consumer magazine. December 1995. Available at: www.fda.gov/fdac/features/095_nail.html
22. FDA (2005) "FDA Authority Over Cosmetics." Center for Food Safety and Applied Nutrition/Office of Cosmetics and Colors. March 3, 2005. Available at: www.cfsan.fda.gov/~dms/cos-206.html
23. Environmental Working Group (EWG) (2005). Skin Deep Database. Available at: www.ewg.org/reports/skindeep2/index.php
24. Moore, B (2000) "Pointing a Finger at Discount Nail Salons" Los Angeles Times. January 28, 2000.



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