

## The Threat of Chemical Contaminants

Contaminants are substances that can have short or long term health-threatening effects. Whether a byproduct of humans (such as blood or other fluids) or other living organisms, or a mix of potentially toxic chemicals associated with the business, these pose a threat to cosmetologists and customers. This module will discuss chemical contaminants associated with the business, and how to properly minimize health risks from chemical contaminants.

### Chemical Awareness

*Here are some common chemicals used in salons and information on their potential health effects.*

Acetone:

Small amounts of acetone are metabolically produced in the body, mainly from fat. In humans, fasting significantly increases its endogenous production. Acetone can be elevated in diabetes. Exposure to exogenous acetone can be chronic due to acetone contamination of water, food (e.g. milk), or the air (acetone is volatile). A number of acute poisoning cases have been described. Relatively speaking, acetone is not a very toxic compound; it can, however, damage the mucosa of the mouth and can irritate and damage skin. Accidental intake of large amounts of acetone may lead to unconsciousness and death.



The effects of long-term exposure to acetone are known mostly from animal studies. Kidney, liver, and nerve damage, increased birth defects, and lowered reproduction ability of males

(only) occurred in animals exposed long-term. It is not known if these same effects would be exhibited in humans.

Interestingly, acetone has been shown to have anticonvulsant effects in animal models of epilepsy, in the absence of toxicity, when administered in millimolar concentrations. It has been hypothesized that the high fat low carbohydrate ketogenic diet used clinically to control drug-resistant epilepsy in children works by elevating acetone in the brain.

Ammonia: (Taken directly from US Department of Labor, n.d.)

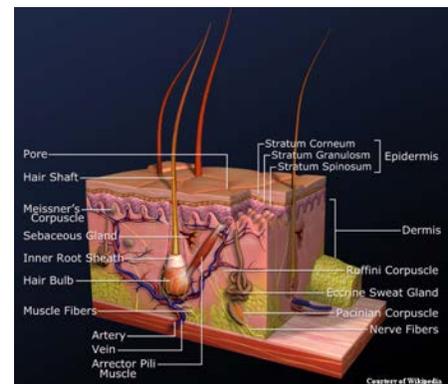
Ammonia is considered a high health hazard because it is corrosive to the skin, eyes, and lungs. Exposure to 300 ppm is immediately dangerous to life and health. Ammonia is also flammable at concentrations of approximately 15 to 28% by volume in air. When mixed with lubricating oils, its flammable concentration range is increased. It can explode if released in an enclosed space with a source of ignition present, or if a vessel containing anhydrous ammonia is exposed to fire. Fortunately, ammonia has a low odor threshold (20 ppm), so most people will seek relief at much lower concentrations.

Bleach:

### **Potential Health Effects**

*Eyes:*

Bleach can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. It can also injure the cornea and cause blindness.



### *Skin:*

Bleach can cause permanent skin damage. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage. Additional symptoms of skin contact may include skin blistering and/or hair loss. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

### *Swallowing*

Swallowing this type of chemical may be harmful or fatal. Symptoms may include severe stomach and intestinal irritation (nausea, vomiting, and diarrhea), abdominal pain, and vomiting of blood. Swallowing this material may cause burns and destroy tissue in the mouth, throat, and digestive tract. Low blood pressure and shock may also occur as a result of severe tissue injury.

### *Inhalation*

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing this material may be harmful or fatal. Symptoms may include severe irritation and burns to the nose, throat, and respiratory tract.

### *Symptoms of Exposure*

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, or diarrhea), cough, tight feeling in the chest, difficult breathing, lung edema (fluid buildup in the lung tissue), lung damage, shock, coma, and death.

### *Target Organ Effects*

This material (or a component) has been shown to lower activity of certain immune system cells in experimental animals. The significance of this effect with respect to human health is uncertain.

### *Developmental Information*

There are no data available for assessing risk to the fetus from maternal exposure to this material.

### *Cancer Information*

Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

### *Other Health Effects*

When combined with an acid or ammonia, sodium hypochlorite may produce chlorine or chloramine gas, respectively. Inhalation of these gases results in coughing, choking, difficult breathing, and other symptoms of respiratory tract irritation. Fluid may collect in the lung tissue following a severe gas exposure.

## **GENERAL DANGERS IN HOUSEHOLD CLEANING PRODUCTS**

Serious exposures to household cleaning substances requiring medical treatment have been documented numerous times by The American Association of Poison Control Centers (AAPCC). In 1993, for example, the most frequent cause of poisoning reported to the AAPCC was cleaning products, including drain and toilet bowl cleaners, bleach, soaps, and detergents.



U.S. poison centers will average one poison exposure every 13 seconds, and in a given year, over two million poisonings will be reported to local poison centers. Most poisonings are unintentional and involve everyday household items such as medicines, cleaning supplies, cosmetics and personal care items. While over three-fourths of exposures involve ingestion of a poisonous substance, other common causes of poisoning by household cleaning products involves inhalation of poisonous fumes or absorption through the skin. The following is an alphabetical list of some of the most common hazardous household cleaning products:

*Air Fresheners* can inhibit your sense of smell through the release of nerve-deadening agents or by coating nasal passages with an oily film (actually a pesticide) that accumulates in human fat cells. Toxins common to air fresheners include formaldehyde (a known carcinogen) and phenol which can cause skin to swell, burn, peel, and break out in hives.

*Ammonia* is a highly toxic and volatile chemical that can cause serious damage to the eyes, respiratory tract, and skin.

*Antibacterial Cleaners* may contain triclosan which, when absorbed through the skin, has been associated with liver damage.

*Bleach* is a strongly corrosive chemical that will irritate or burn the skin, eyes and respiratory tract. If ingested, bleach can cause pulmonary edema, vomiting, and coma. Bleach can produce deadly fumes when mixed with acidic toilet bowl cleaners or ammonia.

*Upholstery and Carpet Cleaners* are designed to overpower the stain, possible only with the use of highly toxic chemicals. Some of these toxins include ammonium hydroxide, a corrosive

substance extremely irritable to the eyes, skin, and respiratory tract, and perchlorethylene, a documented carcinogen linked to liver, kidney and nervous system damage.

As the first agent of chemical warfare, World War II (WW II) ended with an oversupply of *Chlorine*. Since WWII, chlorine has been added to municipal water supplies, swimming pools, and numerous other products. Some argue that chlorine may be a leading cause of breast cancer. While scientists use personal protective equipment (e.g., gloves, face masks, goggles, aprons, ventilation systems) when handling chlorine, this chemical is a common ingredient in most household cleaners. In addition, the harmful effects of chlorine can be increased when the fumes are heated, as often occurs in the shower.

The most common cause of household poisonings is *dishwashing detergent*, which contains chlorine in a highly concentrated form. Every time a dish is washed a residue containing chlorine is left that accumulates with each washing. This residue can be absorbed by food on these “clean” plates, particularly if the food is hot when eaten.

*Furniture polish* contains petroleum distillates, highly flammable and toxic and carcinogenic chemicals, as well as nitrobenzene, a highly toxic chemical that is easily absorbed through the skin.

*Laundry detergents* contain numerous chemicals such as phosphorus, ammonia, naphthalene, phenol, and sodium nitilotriacetate. Residue on washed clothes, when absorbed through the skin can lead to rashes, itches, allergies, and sinus problems.

*Oven cleaners* are some of the most toxic substances used in the household because they contain lye and ammonia, chemicals that can corrode the skin and damage the respiratory tract. Sea salt and baking soda are recommended as a safer alternative to oven cleaners.

*Toilet bowl cleaners* generally contain hydrochloric acid (a corrosive which can irritate the skin and eyes and damage the liver and kidneys) as well as hypochlorite bleach (a corrosive that can burn eyes, skin, and respiratory system). If ingested, toilet bowl cleaners can cause pulmonary edema, vomiting, or coma, and mixing these cleaners with other chemicals can produce chlorine fumes that can be fatal if inhaled.

There are millions of Americans who believe that any product that is approved and sold must be safe. However, during and since WWII more than 80,000 synthetic and potentially toxic chemicals (and approximately 1000 new chemicals are approved every year) have been invented and approved by the federal government. No information on toxicity is available for eighty percent of the chemicals in common every-day use products according to the National Research Council.

The following are three rules for protection from chemical injury and poisoning:

- First, educate yourself on chemical hazards and use safer alternatives when possible (e.g., substituting sea salt and baking soda for oven cleaners).
- Secondly, minimize the use of harsh chemicals. Clean spills and remove food waste immediately, and minimize humidity levels in the home (no greater than thirty to fifty percent).
- Third, keep cleaning substances in their original, marked containers and store them out of children's reach. Carefully follow all label directions, recommendations and safety precautions, and contact the manufacturer immediately if you have any questions.

## **The Dangers of Methyl Methacrylate (MMA) in Salons**

According to Booth Moore of the *Los Angeles Times* (2000), methyl methacrylate (MMA) was introduced in salons in the 1970's as an adhesive for acrylic nails. Acrylic nails are created by combining powdered acrylic with a bonding agent (e.g, MMA) that is prepared as a paste to be spread over the natural nail. Once hardened, the resulting surface is shaped and painted, and "fills" are used to plug the gap that is created between the acrylic and cuticle as the nail grows. While costly, artificial nails are popular among many women, particularly those whose natural nails are brittle and thus susceptible to breakage. In 1999, for example, women in the U.S. spent more than \$4 billion on artificial nail enhancements.

Soon after MMA was introduced as a bonding agent for acrylic nails, the Food and Drug Administration (FDA) began to receive complaints about nail infections, discolorations, and contact dermatitis among other problems. In 1974, the FDA deemed MMA, "a poisonous and deleterious substance" which has been blamed for fungal infections, nail deformities, mucous membrane irritations, headaches, liver and kidney damage, as well as a host of other problems among women who wear artificial nails and nail technicians who work around the substance. Although some salons voluntarily switched their clients to ethyl methacrylate (EMA), a more expensive (EMA can cost as much as \$300 per gallon compared to MMA which can go for as little as \$15 per gallon) but allegedly safer alternative to MMA, many salons, particularly discount salons, continued the use of MMA to stay financially competitive.

While the federal government has warned of the dangers associated with MMA, a bonding agent so powerful it is used for dentures and to adhere prosthetic limbs, since the mid-1970's, the nail industry's voluntary withdrawal of MMA short-circuited the regulatory process. Based on its

investigations, the FDA chose to remove from the market products containing 100 percent MMA through court proceedings, which resulted in a preliminary injunction against one firm as well as several seizure actions and voluntary recalls. However, no *federal* regulation specifically bans the use of MMA in cosmetic products. And while a number of states have imposed prohibitions on the use of MMA in acrylic nails (as of 2000, 30 states had issued regulations on its use), lack of funding at the state level often makes enforcement of these regulations impossible. For example, in California there are 15 inspectors responsible for over 9,000 nail and hair salons in the state.

### ***The Debate over MMA***

Today the debate continues regarding the health risks of MMA, disputed by companies with financial stake in the outcome. Creative Nail Design, a manufacturer of EMA, contends that, relative to EMA, MMA is dangerous because:

- Nail technicians must “rough up” the natural nails with a drill in order to get MMA-based acrylic paste to stick.
- MMA-based acrylics are difficult to remove, and technicians often have to pry up the artificial nail, pulling off layers of the natural nail with it.
- MMA is too strong of a bonding agent for nails, thus natural nails may be ripped out because the acrylic nail did not break off when exposed to environmental trauma.
- As a sensitizer, MMA can cause irritation and allergic reactions when in contact with the skin.

When Susan Stein snagged a finger on her soapy hair, she expected to find a crack in one of her acrylic nails. But what she did find was the acrylic nail lifting off her finger and taking her natural nail with it. And the same thing was happening on her other fingers. An emergency room physician diagnosed her with a widespread fungal infection that could lead to permanent

loss of her natural nails. While not confirmed, Stein is convinced that MMA used at her discount nail salon was the culprit.

However, Jennifer Hajali, Vice President of CA Chemists, a manufacturer of both EMA and MMA for use in nail salons notes, “I haven’t heard from anyone that MMA hurt them.” She further maintains that most cosmetic products (e.g., nail polish and removers, scented lotions) are sensitizers and that the 1974 FDA opinion was based on a much stronger version of MMA than the MMA polymer used today in salons. Steve Miller, a member of the California cosmetology program’s advisory council and owner of a hair care products firm in Los Angeles, asked, “Is there a health risk [with MMA]? No one has died of this. It seems to be more of an inconvenience than anything else. The most impassioned argument I heard was from a lady who had her nail torn off.”

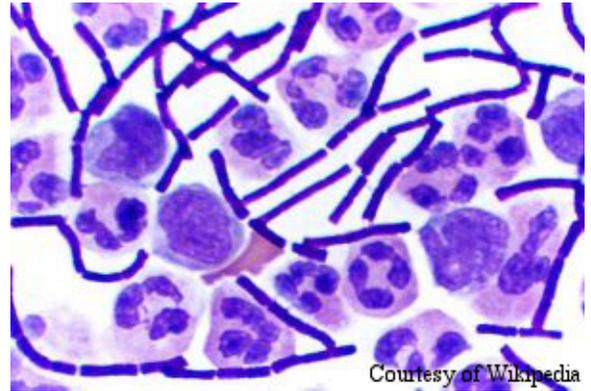
Nancy Hardaker, spokesman for the California state cosmetology board, notes that there has not been one single customer or technician complaint in the last 10 years regarding MMA. Although Susan Stein believes MMA is to blame for her nail fungus, she did not complain to state regulators because it can be difficult to establish a causal link between MMA and nail infections due to lack of research and the difficulty of detecting its use in salon settings.

It is true that the effects of customers’ and technicians’ exposure to MMA are not well researched. The number of salon workers who have experienced health problems due to MMA is unknown. One chemical engineer believes that all chemicals used in nail salons, not just MMA, are hazardous to technicians. Regarding her sister, a nail technician, she remarked, “My sister was sick all the time with respiratory infections and a runny nose. She lost her sense of smell and was always coughing...the first time I visited her salon, I couldn’t believe the fumes. I

said, ‘You are killing yourself!’” Rather than debating regulations, she designed a better-ventilated manicure table after her sister became ill.

### *Difficulty of Detecting the Use of MMA in Nail Salons*

MMA use in salons is difficult to detect because shares similarities with other liquids used to create artificial nails. Several warning signs do exist, however, that might *suggest* the use of MMA in a salon:



- A very strong and strange (often sharp and fruity) odor, different from regular acrylic nail products.
- Extremely hard nails that are difficult to file.
- Artificial nails that are difficult to soak off in acetone or other solvents.
- Low everyday (i.e., non-sale) pricing (e.g., \$25 for a full set of nails) of acrylic nails.
- Salon technicians or management that are secretive about the products being used.
- The use of masks by technicians to prevent inhalation of the noxious fumes.

However, Hardarker notes that MMA “...is supposed to have a strong odor, but a number of manicuring products have an odor.” In fact, MMA looks and smells like a lot of other chemicals used in acrylic nails that are deemed to be safe. Many state regulators can do little about the use of MMA until better, safer, and cheaper methods are developed to test for its presence. In Georgia, for example, samples to be tested for MMA had to be sent to a sophisticated laboratory in Missouri when scientists at Georgia Tech University refused to test for it, for fear the chemical would contaminate their equipment. In this case, testing a small sample for MMA from one

Georgia salon cost \$800, a price too heavy for state regulators to bear across approximately 1700 salons in the state.

### ***The Final Word on MMA Use in Nail Salons***

Some state boards of cosmetology have called on the FDA to take the lead in this matter by officially issuing regulations for the manufacturers and distributors of MMA. As recently as 1999, the FDA determined that the use of EMA in artificial nails is safe and renewed its recommendation that MMA not be used in nail salons. However, outright bans at the federal level have yet to be issued. John Bailey, director of the FDA's Office of Cosmetics and Colors, notes that, "It is on our radar screen, but I can't say when we will take action. Frankly, resources are an issue."

Proponents of the use of MMA in salons cite the FDA's inaction on the topic as proof that the health risks of MMA are minimal, and some industry observers note that more problems arise from sloppy application as much as from the chemicals themselves.



"The MMA issue goes hand in hand with the industry's biggest problem, which is a lack of continuing education," said Kathy Kirkland, editor of *NailPro* magazine. Larger manufacturers of EMA say they try to avoid misuse of their products by sponsoring continuing education seminars around the country. "We pay for education, training, advertising, marketing-- and we have a consumer hotline," said Eric Schwartz, chief operating officer for OPI. However, he notes that these are all costs that the underground market for the continued use of MMA does not bear.

## **CANCER RISKS ASSOCIATED WITH HAIR DYE**

*The following is from an article by Daniel J. DeNoon (2004) posted on Web MD.*

While past research found a link between permanent hair dyes and bladder cancer, more recent research suggests that the long-term use of permanent dark-color hair dye may double a person's risk of certain cancers such as non-Hodgkin's lymphoma. A team of scientists at Yale University, led by Dr. Tongzhang Zheng, explored the connection between increasing use of permanent hair dyes and rising rates of non-Hodgkin's lymphoma. Hair dye use was analyzed in 601 women diagnosed with non-Hodgkin's lymphoma and 717 similar women without cancer.

Results (reported in the January 15, 2004 issue of the *American Journal of Epidemiology*) document an increased risk of non-Hodgkin's lymphoma observed for women who reported the use of dark-colored permanent hair dye before 1980 with this risk doubled in women who had used these hair products for more than 25 years. No increased risk was observed for women who used only semi-permanent dyes or temporary rinses. When asked whether women should stop using permanent hair dyes, Zheng responded that, "Hair coloring is a personal decision for all kinds of reasons...but if semi-permanent or temporary dyes could serve my issue, I would do it. Because these contain much less of the ingredients linked to cancer."

### ***Industry Response to the Research***

Responding to the results of Zheng's study, the Cosmetic, Toiletry, and Fragrance Association (CTFA) notes a 2000 study by researchers at Johns Hopkins University reviewing all known scientific literature on the relationship between hair dyes and cancer. This study suggested that evidence linking hair dyes to cancer is inconclusive and called for improved methodology in future research.

The CTFA also points to two large-scale epidemiological studies that found no significant link between hair dyes and cancer and contends that, “The safety of hair dyes is supported by the overwhelming wealth of scientific research, including several well-designed studies conducted by prestigious institutions such as the American Cancer Society and Harvard University...These large epidemiology studies include more than 570,000 and 120,000 women respectively, and showed no elevated health risk for women using hair dyes.” However, Zheng notes that two other similar studies reached very different conclusions and that all past research has suffered from methodological limitations such as underestimation of hair dye exposure.

### ***Are Today’s Products Safer?***

In 1979, the hair dye industry significantly changed their formulations of most permanent hair dye to remove known cancer-causing agents. Zheng subsequently found no increased risk for non-Hodgkin’s lymphoma in women who began coloring their hair after 1980. That could mean one of two things: Either hair dye products made after 1980 are safe when it comes to cancer risk, or not enough women have been using the new products long enough to get cancer. Zheng says it is impossible to tell which conclusion is correct from his study.

However, additional evidence points to a continued risk of cancer associated with the use of permanent hair dyes. Research conducted by Mimi C. Yu, PhD, professor of preventive medicine at the University of Southern California’s Keck School of Medicine documents a link between hair dye use and risk of bladder cancer. Yu asks, “Is it time to alarm women? The evidence is starting to build up. The hair dye products as they exist out there may not be entirely safe...Definitely more work needs to be done. But the evidence has built up to the point that the scientific community should take note. There should be more work done because we may have a not-so-safe consumer product out there.”

## ***Cancer-Causing Chemicals in Hair Dye***

Perhaps the strongest evidence of the potential dangers posed by hair dyes comes from the FDA's National Center for Toxicological Research. FDA scientist Robert Turesky and colleagues (2003 study published in *Chemical Research in Toxicology*) tested for the presence of a known carcinogen (4-ABP) in hair dye products purchased off the shelves at U.S. supermarkets and hair salons. 4-ABP was detected in eight of the eleven hair dyes tested, including black, red, and blond (but not in brown) hair dyes. Yu indicates that none of these products contain this chemical as a listed ingredient; instead these products are likely contaminated with the substance probably as a byproduct of the manufacturing process.



Yu further notes that, “We have found the smoking gun...FDA scientists actually have detected a known human carcinogen in samples of products on the shelf being sold every day to consumers.” The good news, according to Yu, is that because 4-ABP is an “unintentional” contaminant and not a necessary ingredient of the hair dye, manufacturers can take action to make their products safer.

However, Zheng is more pessimistic. He believes that the chemicals found in permanent hair dyes are not directly responsible for cancer but, instead, cause harmful chemical reactions. Zheng contends, “The issue is that permanent hair dyes all use an oxidizing process that will create new chemicals that are not in the original dye. The oxidizing process will create compounds that will cause cancer. The concern isn't over the compounds in the products, it is the oxidizing process of permanent hair dyes.”

### ***Greater Risks for Some Women***

Some of the carcinogenic chemicals in hair dye are known as aromatic amines, compounds which most human bodies can detoxify. But, a few studies (e.g., a study by Yu published in the journal *Carcinogenesis*) suggest that, due to genetics, some individuals are unable to detoxify these chemicals, leading to greater cancer risks from hair dyes for these people. In spite of this, Yu warns that this doesn't mean hair dyes don't pose a general risk. "I would be hesitant to put women into two baskets -- so many genes are involved," Yu says. "I would say our study suggests the risks are stronger [for women lacking working detox genes], but I wouldn't say women who think they are not deficient could just assume that they are not at risk."

### **DANGERS ASSOCIATED WITH RELAXING HAIR**

*The following is an FDA report (2001) which discusses the dangers associated with certain types of hair relaxers.*

It's never a good sign when the hairdresser panics. That's what happened to Barbara Cabrera-Avila, 38, when she returned to the salon about six weeks after having her hair straightened. The cause for alarm: several bald spots in the back of her head.

The Adelphi, MD, resident began having her curls straightened at the age of six so her hair would be easier to comb and style. She says over-processed hair likely played a role in her hair loss, and stress could have been a factor. What's certain is that three dermatologists advised her to take a break from hair straighteners, also known as relaxers.

Barbara says giving up the straight hair she had grown comfortable with wasn't easy. After all, people's personal preferences about



how they want to look tie into self-esteem--a fact that makes for good sales in the hair business. In addition to paying for trims and cuts to achieve a certain look, consumers spend millions of dollars each year to get hair that's different from what nature intended--whether it's to tame tight curls, give flat hair a boost, or get rid of the gray.

According to the Food and Drug Administration's Office of Cosmetics and Colors, hair straighteners and hair dyes are among its top consumer complaint areas. Complaints range from hair breakage to symptoms warranting an emergency room visit. Reporting such complaints is voluntary, and the reported problem is often due to incorrect use of a product rather than the product itself. FDA encourages consumers to understand the risks that come with using hair chemicals, and to take a proactive approach in ensuring their proper use. The agency doesn't have authority under the Federal Food, Drug, and Cosmetic Act to require pre-market approval for cosmetics, but it can take action when safety issues surface.

#### When the Product Is the Problem:

When consumers notify FDA of problems with cosmetics, the agency evaluates evidence on a case-by-case basis and determines if follow-up is needed, says Allen Halper, an FDA consumer safety officer. FDA looks for patterns of complaints or unusual or severe reactions. The agency may conduct an investigation, and if the evidence supports regulatory action, FDA may request removal of a cosmetic from the market.

Take the example of two popular hair relaxer products by World Rio Corp.--the Rio Naturalizer System (Neutral Formula) and the Rio Naturalizer System with Color Enhancer (Black/Licorice). After receiving complaints about these products in November and December of 1994, FDA warned the public against using them. Consumers complained of hair loss, scalp irritation, and discolored hair.

In December 1994, the World Rio Corp. of Los Angeles, Calif., announced that it stopped sales and shipments of the product. But reports indicated that the company continued to take orders, and the California Department of Health also stepped in to stop sales. In January of 1995, the U.S. Attorney's Office in Los Angeles filed a seizure action against these products on behalf of FDA. By then, the agency had received more than 3,000 complaints about the Rio products.

Although most relaxers are alkaline, this product was formulated to be acidic. In the resulting consent decree of condemnation and permanent injunction, FDA alleged that the products were potentially harmful or injurious when used as intended, that they were more acidic than declared in the labeling, and that the labeling described the products as "chemical free" when "allegedly they contained ingredients commonly understood to be 'chemicals.'"

#### Safer Straightening:

FDA has received complaints about scalp irritation and hair breakage related to both lye and "no lye" relaxers. Some consumers falsely assume that compared to lye relaxers, "no lye" relaxers take all the worry out of straightening.

"People may think because it says 'no lye' that it's not caustic," says FDA biologist Lark Lambert. But both types of relaxers contain ingredients that work by breaking chemical bonds of the hair, and both can burn the scalp if used incorrectly. Lye relaxers contain sodium hydroxide as the active ingredient. With "no lye" relaxers, calcium hydroxide and guanidine carbonate are mixed to produce guanidine hydroxide.

Research has shown that this combination in "no lye" relaxers results in less scalp irritation than lye relaxers, but the same safety rules apply for both. They should be used properly, left on no

longer than the prescribed time, carefully washed out with neutralizing shampoo, and followed up with regular conditioning. For those who opt to straighten their own hair, it's wise to enlist help simply because not being able to see and reach the top and back of the head makes proper application of the chemical and thorough rinsing more of a challenge.

Some stylists recommend applying a layer of petroleum jelly on the scalp before applying a relaxer because it creates a protective barrier between the chemical and the skin. Scratching, brushing, and combing can make the scalp more susceptible to chemical damage and should be avoided right before using a relaxer. Parents should be especially cautious when applying chemicals to children's hair and should keep relaxers out of children's reach. There have been reports of small children ingesting straightening chemicals and suffering injuries that include burns to the face, tongue, and esophagus.

How often one relaxes their hair is a personal decision. According to Pearl Freier, an instructor at the International Academy of Hair Design in South Daytona, FL, relaxing at intervals of six to eight weeks is common, and the frequency depends on the rate of a person's hair growth. Leslie F. Safer, MD, a dermatologist in Albany, GA, who has treated women with scalp irritation from relaxers, says straightening every six weeks is too frequent, in his opinion. Relaxers can cause hair breakage in the long term, he says, and blow drying and curling can do more damage.

Consumers should be aware that applying more than one type of chemical treatment, such as coloring hair one week and then relaxing it the next, can increase the risk of hair damage. "The only color we recommend for relaxed hair is semi-permanent because it has no ammonia and less peroxide," compared with permanent color, Freier says.

## DANGERS IN HAIR SALONS

*The following are excerpts from an article published in Reuters which warns of health risks posed by chemicals commonly found in hair salons.*



According to scientists at Boston University's School of Public Health, hair salon workers' health may be at risk from daily exposure to chemical agents found in hair relaxers and dyes. "We conducted a preliminary study to assess occupational exposures and subsequent health risks to workers in Boston hair salons that serve primarily African-American women," said lead investigator Julie Watts. "We plan to use the information that we obtained to help salon workers so that they can reduce their exposure from potentially harmful products."

Among 56 workers interviewed in 10 salons, 15 percent claimed to be suffering from asthma, eczema, and hives, while 30 percent reported hay fever. These salon workers reported no control over the ventilation of their work area and no access to material safety data sheets (MSDS), information provided by manufacturers detailing the health risks to exposure and safe handling techniques. Watts noted that some of these salon workers performed up to 20 hair relaxing treatments in an average day, a much higher exposure compared to the general population. However, the study failed to document a causal link between working in a salon environment and the reported health conditions.

Watts explained that relaxers contain lye and other caustic chemicals that are needed to break the hydrogen sulfide bonds of the hair to straighten it. These chemicals primarily enter the body through the skin and to a lesser extent through inhalation, and exposure to chemicals found in relaxers and coloring agents have the potential to exert harmful biological and physical effects on

the body. Based on previous toxicological studies, documented health effects of hair relaxers include burns, irritation to mucus membranes, dermatitis, coughing and airway irritation.

“The main recommendation that we make is to improve ventilation, and encourage the workers to get as much fresh air as possible,” Watts stated. We “also tell workers not to eat, drink or smoke when using these products so they don’t accidentally ingest the chemicals.”

Some customers occasionally relax their hair at home between salon visits. The following are some tips to make this process safer.

The Do’s of relaxing hair at home:

- Use “no lye” relaxers and avoid lye-based relaxers.
- Do read all product instructions *BEFORE* you start the relaxing process. With any relaxer kit, you must carefully follow all directions to avoid potential skin and scalp burns, hair loss and eye injury.
- Do contact the manufacturer for clarification if you have any questions.
- Do a strand test before relaxing.
- Do apply a thick layer of protective petroleum jelly or other related substance to protect skin and scalp from burns.
- If you have braided hair, undo braids then shampoo and condition hair approximately one week prior to using relaxer.
- Do enlist help because not being able to see and reach the top and back of the head makes proper application of the chemical and thorough rinsing difficult.
- Do rinse all chemicals completely from the hair and apply any neutralizers exactly as instructed.

The Don'ts of relaxing hair at home:

- Do not apply relaxer directly to scalp.
- Do not use a relaxer if scalp is irritated or inflamed.
- Do not scratch scalp, or brush or comb hair before applying a relaxer.
- Do not use on bleached hair, henna treated hair or on hair dyed or relaxed with products containing metallic substances.
- Do not use after coloring your hair with permanent hair color. Wait at least 3 weeks before relaxing your hair, and proceed only if hair shows no signs of damage.
- Do not use on permanently waved or curly hair.
- Do not pre-shampoo hair. Wait at least 3 days after last shampoo before relaxing your hair.
- Do not wet or manipulate scalp in any way before application since a wet scalp will be more prone to damage.
- Do not use hot combs, pressing irons, or any other heated implements with the relaxer.
- Do not use hot combs 8 days before or immediately after using a relaxer.