

“Toxicity and medical safety of household products “

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"It is the mission of the physician to safeguard the health of people. His or her knowledge and conscience are dedicated to the fulfilment of this mission. Biomedical research involving human subjects should be conducted only by scientifically qualified persons and under supervision of a clinically competent medical person. The responsibility for the human subject must always rest with the medically qualified person and never rest on the subject of the research, even though the subject has given his/ her consent."In the special case of non therapeutic biomedical research involving human subjects, " in the purely scientific application of medical research carried out on a human being, it is the duty of the physician to remain the protector of the live and the health of that persons on whom it is carried out. In research on man , the interest of science and society should never take precedence over considerations related to the well-being of the subject."

These excerpts taken from the world Medical Association's Declaration of Helsinki in its latest updated version outline the key principle for the conduct of drug and cosmetic clinical studies, and therefore household products, too. For the latter ones as a rule, a non-drug clinical study will always been given, if the biological endpoints chosen to control an effect do not exclude with certainty pathophysiological changes e.g. sensitisation or marked irritation.

Safety documentation for test products

There is no difference between drug, non-drug or household products in the clinical investigator's responsibility to be thoroughly familiar with the properties of a test products. In any case, no test product should be applied to a trial subject, for which formulation, identity, and safety are not properly known, including the description of the way the product was made to the extend this is relevant to the safety pattern of the finished product.

For drug products, requirement for type and scope and safety data are defined by regulation and both have to be met with complete documentation, for all raw materials used and the finished product. For non drug products, like those for skin-care or household products, a detailed risk assessment by a competent toxicologist is needed, and is typically provided by the investigator's sponsor. This may include historical data on individual raw materials or extrapolation to the state of the art in toxicology from similar preparations onto the risk associated with the new product. This type of risk assessment is valid and justified by the kind of chemicals typically used in skin care products. In part it is also necessity as in recent years in many countries, regulations have drastically restricted the conduct of animal testing of cosmetics. However, the risk assessment is done properly by the responsible toxicologist, this is an acceptable situation for both the trial subject and the responsible clinical investigator. Another safeguard comes from the fact that the effects permitted for skin care products are regulated under the EC Cosmetic Art resulting in formulations free of systemic effects, most constituents of which do not, or do not to a relevant extent, penetrate the barrier of the skin.

There is no legal requirement for the manufacture of non-drug products like household products or skin care products under GMP, but Industry typically applies the principle of these standards. In any case it should be required that a test material is known and is intended before trial subjects are exposed.

The best possible protection of human health is the essential prerequisite for the conduct of both drug and non-drug clinical studies. This is reflected by the fact that key requirements for their proper conduct do not differ at all. Differences in the principles for the conduct of non-drug clinical studies occasionally requiring less rigorous executional detail are justified by

and based on the fact that biomedical research conducted with them is typically much less risky to trial subjects than that with drugs. However, there is no excuse for non-drug clinical trials to be conducted with less quality or less good science. Obviously, the Responsible Clinical Investigator has to be satisfied with the risk assessment for the test products provided by the sponsor, demonstrating that trial subjects are not put at any undue health risk. Complete information about benefits and risk associated with the use of a non-drug product, the agreement to which is documented in a Written Informed Consent is a critical aspect, but it cannot substitute for the obligation of the Responsible Clinical Investigator to safeguard the health and welfare of the trial participants. In addition, assurance of proper protection of trial subjects by an independent Ethics Committee remains an indispensable requirement. While the requirements for proper statistical design, data collection and analysis of data generated during a clinical trial do not differ between drug and non-drug clinical studies, the requirements for archiving of data more flexible with non-drug products. In the evaluation of the results of a non-drug clinical study, any clinically relevant finding-positive or negative-has to be carefully assessed for its consumer relevance under consideration of the legal requirement of absence of health risks from a non-drug product under conditions of uncontrolled recommended or reasonably foreseeable use

Household products

The group of household products is extraordinarily varied and inhomogeneous. Included are cleansing agents, stain-removers, detergents and cloth-caring as well as pesticides, protection of plants, vanish and car supply.

The household cleaning agents, personal care products, pesticides, paints, hobby products, and solvents that make our lives so easy are also sources of hundreds of potentially harmful chemicals. The range of household products that contain potentially harmful substances that contribute to indoor air pollution is wide-reaching and diverse. Some of these products release contaminants into the air right away; others do so gradually, over a period of time. The harmful components in many household and personal care products can cause dizziness, nausea, allergic reactions, and eye, skin, and respiratory tract irritation; some can cause cancer. When you use these products, make sure that you are in an area with adequate ventilation. - Contamination from household products, if limited to low levels for short periods of time, does not pose a serious health threat. However, contamination can occur over a long period of time from a variety of sources, and harmful effects can occur. Where there is prolonged exposure and where there is a possible multiplying effect from the presence of contamination from many different products, the effects can be serious, even fatal. - Even correct usage, but the more improper application, especially accidental misuse by toddlers and children bears the risk of multiple and various health defects.

Toxicity

That some household product are potentially dangerous, is even catching the eye. Paint stripper, Varnish, Pesticides for example are for sure toxic with incorporation, and will cause health damage. - What is not so widely known, is, that even "common" cosmetics can be toxic. Such are bubble baths and bath salts, hair cosmetics, nail varnish and alcohol-containing cosmetics like perfumes and hair lotion. Two mouthful of nail varnish remover can kill a two year old. Permanent waves, neutralisation suspension, nail varnish remover are estimated as most toxic by the Swiss Tox Association. For babies even simple talc powder can be dangerous, they can suffer from a bronchial obstruction afterwards, which can lead to death. Aerosols e.g. from deodorants, are used from glue-sniffers to make themselves euphoric, lethal intoxication are common with that.

It is presumed that there is a long-term toxicity or a long-term cancer potential for some substances, which are in use, but not long enough, to produce its dangerous side-effects.

An example for this are the health-difficulties and damages caused by asbestos. - In the list of cancer-causing substances from 23.04.1990 you can find materials, that are used in many household products: nickel- and chromium compounds, vinylchloride and nitrose combinations. - Incomplete content-tables on the packages and missing devices on all single contents make it very difficult to treat the appearing intoxication, corrosive injuries and life-threatening damages. Additionally, only minimal warning advice and unclear and dissatisfactory instructions increase the risk even more. Knowledge about the toxicity of a product does not allow direct conclusions about the dangerous dose in human beings. Results from animal testing, when they exist at all, are at best slightly comparable to effects in man. The projections of the single toxicity of all product ingredients leads only to assumptions. Relations between doses and effects are missing for the most chemical substances.

Although there is no classification of toxicity from medical sight, Velbart gave a gradation with regard to medical treatment:

1. no endangering, slight, unspecific, local irritations in less than 10% of all cases
2. moderate endangering, slight irritations in less than 50% of all cases and/or severe intoxication in less than 5% and/or lasting defects
3. severe endangering, slight irritations in more than 50% of all cases and/or severe intoxication in more than 5% and /or lasting defects

Accidental Poisoning

Accidental poisoning is the third largest cause of death in children under 10 years of age and is a devastating situation for both patients and family members. The East Tennessee Poison Control Program is focusing on poison prevention in the home. 70% of all accidental poisonings occur in children under 6 years of age, and more than 90% of these poisonings occur at home. Furthermore, these poisonings most commonly occur in the late afternoon and early evening hours when supervision of children may not be as strict. Young children are particularly at risk because of their habits of putting things in their mouths while exploring, and because they are not able to read warning labels on medicines and household products. For these reasons, the East Tennessee Poison Control Program is urging all households with small children to take time to survey their home and the homes of grandparents and other relatives and friends where small children live and visit. - Accidental poisonings cause many thousands of injuries to children each year. Almost all childhood poisonings are caused by unsafe storage and handling of household products and medicines. - Household products most commonly involved in potentially serious poisoning accidents include but are not limited to:

- Medicines and vitamins
- Caustics (e.g., toilet and drain cleaners, oven cleaners).
- Petroleum distillates (e.g., gasoline, lighter fluids, liquid furniture polish, paint thinner).
- Pesticides, particularly insecticides.
- Cleaners and disinfectants.
- Car products.

Most household products and medications are routinely stored in convenient locations. Unfortunately these items are usually as accessible to small children as adults. - With the increasing demands for cleaning agents highly effective substances are commonly used, that were just used in industry a few years before. Even a common detergent has to clean every stain and dirt at the lowest temperature possible with a minimum of powder. - It is obvious, that high requirements focused on a household product, are not fulfilled without effective and sometimes toxic substances.

Carpet cleaning agents and special stain removers are often indicated with warning advice, that direct contact, even with healthy, adult skin is to be avoided. - Even nearer comes the problem with pesticides and insecticides. Those are substances which are supposed to be highly toxic for animals and microbes. That these substances are dangerous for man is widely known. But it is surprising to see the carelessness these products are used and see and read about the frequent poisonings caused by those.

Varnish and paint thinner, substances for impregnation and building equipment are also potentially dangerous products. - The craftsman, who uses the substance with the necessary caution, which he or she has learned, so may the handyman who uses the substance without further knowledge suffer enormous damage especially at his skin or respiratory tract.

Safety aspects

A labelling-duty for household products exists, but there are only rough advice and slightly informative danger signs. Mostly there is the advice not to mix with other substances, and that there should be a good air circulation, sometimes you are informed about protective clothing. Safety aspects for the handling with household products do especially concern a group of people who are occupationally exposed to these products. Threshold values, e.g. the MWC (maximum work place concentration) regulate the permitted highest concentration of chemical substances an employee is exposed to. Considered are different ways of incorporation: the oral and inhalation intakes as well as intake by skin absorption after external contact.

The admittance and legitimisation of household products in Germany is subordinated to the LMBG (Lebensmittel und Bedarfsgegenstandesgesetz), in the US exists a US Consumer Product Safety Commission, who is responsible for examination of household products. Every component has to be examined by animal testing. The LD 50 has to be determined, and so is the maximum workplace concentration (MAC).

The question is: Can values determined on animals confirm dangerous amounts of a substance in man?

The handyman often is not conscious about the substance he is working with. He can not determine the Toxicity or the long-term damage. And so he does not know, which reactions may occur when mixing with other products. Which are the possibilities for consumers of household products in daily life to avoid health damage?

Exact descriptions of all ingredients, raw materials and additives used in household products give the Cosmetic Ingredient Review (CIR) Expert Panel who proves each chemical substance for their using in finished products. The CIR list includes now approximately 450 reviews of substances, which are very useful for safety assessment. But not useful for consumers because one needs very specific chemical knowledge to understand these information. Manufacturers of all household products (the chemical industry) are obliged within the safety regulations to develop and to optimise constantly the formulations of their products. It would be desirable for the protection of consumers if household products should have been tested like cosmetic products have to. The EEC-Cosmetic Directive stipulates human tests (e.g. patch test, in use test) for the finished product. There should not only be a danger sign on household items, but enough information to get an idea of the possible potency of damage of any kind.

Useful are therefore:

1. full declaration of all ingredients,
2. specific links about toxicity, cancerogenicity and mutagenicity,
3. comprehensible classification of the product in classes of endangerment.

The fundamental problems are following: determination of the index for the initial irritation of the skin (Dos. Irrit. 50), of the sensitisation potency and of the acute dermal toxicity (LD50). These investigations must form part of all minimum programmes. In addition, it must be distinguished between investigations required only for long-term approval of a substance and those considered necessary for the approval of a preparation for only a short period. Safety regulations, known by now, do not give enough information about dangers of long-term usage. In difference to acute toxicity effects the chronic toxicity is any long-term, cumulative negative health effect caused by repeated low-level exposure to either a product or a specific chemical component. These low-level doses mostly cannot be exactly determined. Excluding few substances there is little known about the cancerogenity of daily items, especially considering cancer in childhood (Goldmann 1999). Positive can be judged the program of the U.S. EPA (Environmental Protection Agency) which wants to run a broad and international toxicity screening. Collected are all information to clear up the role of commercial chemicals in developing infant-cancers. Additionally preventive measures shall be worked out to reduce exposure to children or pregnant women from such substances.

The Household Toxics Tour

Toxic chemicals in the home can be eliminated simply by making thoughtful choices in the supermarket after educating oneself about where the hazards are in common consumer products. How can you determine what toxics you have in your home? Take this "toxics tour." In the Kitchen:

All-purpose cleaner, ammonia-based cleaners, bleach, brass or other metal polishes, dishwasher detergent, disinfectant, drain cleaner, floor wax or polish, glass cleaner, dishwashing detergent, oven cleaner, and scouring powder contain dangerous chemicals. Some examples are:

- sodium hypochlorite (in chlorine bleach): if mixed with ammonia, releases toxic chloramine gas. Short-term exposure may cause mild asthmatic symptoms or more serious respiratory problems;
- petroleum distillates (in metal polishes): short-term exposure can cause temporary eye clouding; longer exposure can damage the nervous system, skin, kidneys, and eyes;
- ammonia (in glass cleaner): eye irritant, can cause headaches and lung irritation;
- phenol and cresol (in disinfectants): corrosive; can cause diarrhea, fainting, dizziness, and kidney and liver damage;
- nitrobenzene (in furniture and floor polishes): can cause skin discoloration, shallow breathing, vomiting, and death; associated with cancer and birth defects;
- formaldehyde (a preservative in many products): suspected human carcinogen; strong irritant to eyes, throat, skin, and lungs.

In the Utility Closet:

A number of products are likely to contain toxic ingredients: carpet cleaner, room deodorizer, laundry softener, laundry detergent, anti-cling sheets, mold and mildew cleaner, mothballs, and spot remover all usually contain irritant or toxic substances. Examples:

- perchloroethylene or 1-1-1 trichloroethane solvents (in spot removers and carpet cleaners): can cause liver and kidney damage if ingested; perchloroethylene is an animal carcinogen and suspected human carcinogen;
- naphthalene or paradichlorobenzene (in mothballs): naphthalene is a suspected human carcinogen that may damage eyes, blood, liver, kidneys, skin, and the central nervous system; paradichlorobenzene can harm the central nervous system, liver, and kidneys;
- hydrochloric acid or sodium acid sulfite in toilet bowl cleaner; either can burn the

skin or cause vomiting diarrhea and stomach burns if swallowed; also can cause blindness if inadvertently splashed in the eyes;

- residues from fabric softeners, as well as the fragrances commonly used in them, can be irritating to susceptible people;

possible ingredients of spray starch (aside from the starch) include formaldehyde, phenol, and pentachlorophenol; in addition, any aerosolized particle, including cornstarch, may irritate the lungs.

In the Living Room and Bedroom:

Even the furnishings of the typical American home can be harmful. Fabrics that are labeled "wrinkle-resistant" are usually treated with a formaldehyde resin. These include no-iron sheets and bedding, curtains, sleep wear -- any woven fabric, but especially polyester/cotton blends, marketed as "permanent press" or "easy care." More modern furniture is made of pressed wood products emits formaldehyde and other chemicals. Carpeting is usually made of synthetic fibers that have been treated with pesticides and fungicide. Many office carpets emit a chemical called 4-phenylcyclohexene, an inadvertent additive to the latex backing used in more commercial and home carpets, which is thought to be one of the chemicals responsible for "sick" office buildings.

In the Bath:

Numerous cosmetics and personal hygiene products contain hazardous substances. Examples:

- cresol, formaldehyde, glycols, nitrates/nitrosamines and sulfur compounds in shampoos;
- butane propellants in hair spray (replacing carcinogenic methylene chloride), as well as formaldehyde resins;
- aerosol propellants, ammonia, formaldehyde, triclosan, aluminum chlorhydrate in antiperspirants and deodorants'
- glycols, phenol, fragrance, and colors in lotions, creams, and moisturizers.

In the Studio or Hobby Room:

Although legislation controlling many of the dangerous ingredients in hobby materials has recently been passed, exposure to certain art materials remains a health risk. Dangerous chemicals and metals include:

- lead in ceramic glazes, stained-glass materials, and many pigments;
- cadmium in silver solders, pigments, ceramic glazes and fluxes;
- chromium in paint pigments and ceramic colors;
- manganese dioxide in ceramic colors and some brown oil and acrylic paint pigments;
- cobalt in some blue oil and acrylic paint pigments;
- formaldehyde as a preservation in many acrylic paints and photographic products;
- aromatic hydrocarbons in paint and varnish removers, aerosol sprays, permanent markers, etc.;
- chlorinated hydrocarbons (solvents) in ink, varnish, and paint removers, rubber cement, aerosol sprays;
- petroleum distillates (solvents) in paint and rubber cement thinners, spray adhesives, silk-screen inks;
- glycol ethers and acetates in photography products, lacquer thinners, paints, and aerosol sprays.

In the Garage:

A number of dangerous substances are frequently present, including paint, paint thinner, benzene, kerosene, mineral spirits, turpentine, lubricating/motor oils, and gasoline. Hazards among them include these chemicals:

- chlorinated aliphatic and aromatic hydrocarbons in paint thinner can cause liver and kidney damage;
- petroleum hydrocarbons, an ingredient of gasoline, motor oils, and benzene, are associated with skin and lung cancer;
- mineral spirits in oil-based paint are a skin, eye, nose throat, and lung irritant. High air concentrations can cause nervous system damage, unconsciousness and death;
- ketones in paint thinner may cause respiratory ailments; vary according to specific form of the chemical;
- ketones and toluene in wood putty; toluene in highly toxic, may cause skin, kidney, liver, central nervous system damage; may damage reproductive system.

In the Garden Shed:

Pesticides, one of the most important single hazards in the home. Around 1,400 pesticides, herbicides, and fungicides are ingredients in consumer products. Combined with other toxic substances such as solvents, pesticides are present in more than 34,000 different product formulations.

On the Patio:

Charcoal lighter fluid contains petroleum distillates. Besides being flammable and imparting a chemical taste to food, some petroleum distillates contain benzene, a known human carcinogen.

Safe Substitues for Household Toxics

Until World War II and the zenith of the Chemical Age that followed war-related research, householders used a limited number of simple substances to keep most objects in the house clean, order-free, and pest-free. Soap, vinegar, baking soda, washing soda, ammonia, borax, alcohol, cornstarch, and certain food ingredients were used to lift out spots and stains, deodorize, polish wood or metal, disinfect, scrub, repel pests, clean pets, wash and starch clothes, and to perform countless other household tasks. Simple cosmetic preparations kept hair lustrous and skin supplied with the aid of ingredients such as eggs, oil, clay, vinegar, and herbs. - The garden was fertilized and pests were kept down with naturally occurring substances. Weeds were weeded by hand. Even though some natural pesticides, like nicotine and rotenone, were indeed toxic to humans, they were not persistent in the environment. They degrade soon after application. Pyrethrum, a pesticide derived from a variety of chrysanthemum which is nontoxic to mammals, controlled a wide spectrum of pests. Although it is still widely used, it is usually mixed with other chemicals to increase its potency. Buildings of the past were made with wood, brick, stone, glass, plaster, and cement. Furniture was made of solid wood, oiled to keep it polished. Rugs or carpets were made of wool or cotton. Insulation was built in by making walls thick, and roofing was constructed from wood shingles or tiles of clay or stone. Walls were plastered. Windows were made to be opened, so at least in good weather there was plenty of natural ventilation.

But toxic materials also were present in homes of the past. Not knowing enough about their hazards, housewives used such chemicals as arsenic, lead, and mercury to perform certain household chores. Interior and exterior paints were often made with lead; many American children are still living with the legacy of lead poisoning caused by eating chips of leaded paint. Asbestos, called a miracle mineral when its fire-resistant properties were discovered, is now known to be a cancer causer that contaminates hundreds of thousands of residences, schools, and other buildings in this country.

We do not need to return to the ways of the past to avoid exposure to house toxics, but we can take some lessons from the past for a better future. How can we do this?

- **But Safe Substitutes.** For example, search for a soap-based garden insecticide (at least one national brand is available) instead of chemically--based ones.
- **When in Doubt, Leave it Out.** In cases where there is no effective safe substitute for a toxic product, reevaluate how important the goal really is. Must you absolutely get rid of all insects in your garden, or can you live with some chewed-up leaves? If the goal is absolutely imperative, such as ensuring that termites do not invade your house, it is important to educate yourself thoroughly. You may have more healthful alternatives than your local pest company tells you.

What you can do

Household products: Many homes contain products that can be environmental hazards like cleaning products, drain cleaner, antifreeze. These common household products give off dangerous fumes or leave residues. Many can be harmful if they are not thrown away properly (for example, if they are left in the garage).

- Only use these products when necessary.
- Always use adequate ventilation.
- Store them in a safe place.
- Dispose of empty containers through your local hazardous waste disposal center.

Molds:

Molds grow almost anywhere and can be found in any part of a home. Common places where molds grow include:

- damp basements
- closets
- shower stalls and bathtubs
- refrigerators
- air conditioners and humidifiers
- garbage pails
- mattresses
- carpeting (especially if it got wet)

Molds can cause health problems in children. Children who live in moldy places are more likely to develop allergies, asthma, and other health problems.

- Keep the surfaces in your home dry.
- Wet items (such as carpeting that cannot be dried) should be thrown away.
- Keep air conditioners and humidifiers clean and in good working order.
- Use exhaust fans in the kitchen and the bathroom to help keep the air dry.
- Avoid using items that are likely to get moldy like foam rubber pillows and mattresses.

On the job hazards brought into the home:

Sometimes a parent's job can create environmental hazards to children. This can happen when lead, chemicals, and fumes from the workplace are brought into the home on skin, hair, clothes, or shoes. People who work in the following areas are most at risk for bringing chemicals into the home:

- painting and construction sites
- auto body or repair shops
- auto battery and radiator factories
- shipyards
- area in which the person comes into contact with harmful metals or chemicals

- Find out if you are exposed to lead, asbestos, mercury, or chemicals on your job.
- If so, shower and change out of work clothes and shoes before coming home.
- Wash the work clothes separately from other laundry.

Asbestos:

Asbestos is a natural fiber that was commonly used in schools and homes for fireproofing, insulation, and soundproofing between the 1940s and 1970s. Asbestos is not dangerous unless it becomes crumbly. If that happens, asbestos fibers can be released into the air and breathed into the lungs. Breathing in asbestos fibers can cause chronic health problems, including a rare form of lung cancer. Schools are required by law to either remove asbestos or make sure that children are not exposed. Asbestos can still be found in certain older homes, particularly as insulation around pipes.

- Do not allow children to play around exposed or deteriorating materials that may contain asbestos.
- If you think there is asbestos in your home, have a professional inspect it.
- If your home has asbestos in poor condition, use a certified contractor to help solve the problem. You could have more problems if the asbestos is not removed safely.

What children eat and drink

Lead:

Of all the problems caused by our environment, lead poisoning is one of the most serious. Infants and toddlers can get sick by putting their fingers in their mouths after touching lead dust, eating lead paint chips, or breathing in lead dust. Lead poisoning can cause learning disabilities, behavioral problems, anemia, or damage to the brain and kidneys.

WHERE CAN LEAD BE FOUND?

Lead is most often found in:

- paint that is on the inside and outside of homes built before 1978
- dust and paint chips from old paint
- soil that has lead in it
- hobby materials such as paints, solders, fishing weights, and buckshot
- food stored in certain ceramic dishes (especially if dishes were made in another country)
- older painted toys and furniture such as cribs
- tap water, especially in homes that have lead pipes
- mini-blinds manufactured outside the United States before July 1996

Children who have elevated lead levels may not look or act sick. The only way to know if your child has been exposed to lead is to have your pediatrician test your child's blood.

WHAT YOU CAN DO

- If your home was built before 1978, consider testing the paint for lead before beginning any work.
- If lead paint is found, learn about safe ways to handle it before any work is done.
- Clean and cover any peeling, flaking, or chipping paint with a new coat of paint, duct tape, or contact paper. It is important to check for flaking paint at window areas where children often play.
- Repair areas where paint is chipped or peeling before placing cribs, playpens, beds, or highchairs next to them.
- Check with your health department to see if lead in water is a problem in your area.
- Do not use hot tap water for mixing formula, drinking, or cooking.
- Ask your pediatrician about testing your child for lead. A blood test is the only accurate way to test for lead.
- Encourage your children to wash their hands frequently, especially before eating.
- Give your child a healthy diet that includes food high in iron and calcium.

- Before moving into a home or apartment, check with your landlord or realtor for possible lead contamination.

Pesticides:

Children can be exposed to pesticides in the food they eat and the water they drink. They are used by farmers as well as in home lawn and garden care. Although they are designed to kill insects, weeds, and fungi, many pesticides are toxic to the environment and to people, especially children. Too much exposure to pesticides can cause a wide range of health problems.

- Keep all pesticides out of children's reach to avoid accidental poisoning.
- Wash all fruits and vegetables with water.
- Use in-season produce as they are less likely to be heavily sprayed.
- If possible, eat foods that are grown without the use of chemical pesticides.
- Use non-chemical pest control methods in your home and garden.
- Notify neighbors before any outdoor spraying.

Drinking water:

Children drink 5 to 10 times more water for their size than adults. Most of this water is tap water. The quality of tap water in most areas is protected by law. Small water supplies such as those from private wells in small trailer parks or seasonal holiday communities are not.

Many people use bottled water because they think it is better than tap water. Some brands of bottled water are better than tap water. However, other brands of bottled water may only be tap water that is bottled and sold separately. Bottled water is much more expensive than tap water, but may be necessary in some areas.

A number of possible contaminants in drinking water can make children sick. These include:

- germs
- nitrates
- heavy metals
- man-made chemicals
- radioactive particles
- by-products of the disinfecting process

Some of these contaminants are more likely to be found in surface water (water from lakes and rivers). Others are more likely to be found in ground water (water from wells and underground sources). Where you live and where your drinking water comes from have a lot to do with the kind of contaminants you need to be concerned about in your water.

The quality of water in the United States e.g. is among the best in the world, but problems do still occur. County health departments and state environmental agencies are the best sources of information about water quality in your community.

- Find out the source of your water.
- If you are on a municipal water supply, the water company is required to tell you what is in the water.
- If your water is not regulated, have it tested yearly. Many states have laws that protect renters from water supplies that are not in good working order.
- If you have a well, make sure your water is tested yearly and that your pump is in good working order.
- Always drink and cook with cold water. Contaminants can build-up in hot water heaters.
- If you are not sure of your plumbing, run the water for 2 minutes each morning before using water for drinking or cooking. This flushes the pipes and reduces the chances of a contaminant getting into your water.
- If you have well water and a baby under 1 year of age, have your water tested for nitrates before giving it to your baby. Breastfeeding, using ready-to-feed formulas, or

using bottled water is wise until you know if your water is safe. If you have questions, call your health department.

If you think your water may be contaminated with germs, you can kill most of them by boiling the water and letting it cool before use. Do not boil water for longer than 1 minute. This can cause a buildup of chemicals that may be in the water.

Where children learn and play

Sun:

Warm, sunny days are wonderful. But what may seem harmless can be very bad for you and your child. The sun is the main cause of skin cancer, the most common form of cancer in the United States. A child's skin is very delicate and can burn easily. Sunburns can be very painful and can cause a child to become sick. The sun's rays can also cause damage to the eyes.

- Keep babies under 6 months of age out of direct sunlight.
- Choose a sunscreen made for children with a sun protection factor (SPF) of at least 15.
- Use hats and sunglasses to protect your child's head and eyes from the sun.
- Encourage the use of shaded areas for your child's outdoor activities between 10 am and 4 pm when the sun's rays are strongest.
- Dress your child in lightweight clothing that covers as much of the body as possible and practical.

Outdoor air pollution:

There are a number of things in the air that can be harmful to children. One serious type of air pollution is ozone. Ozone is a colorless gas that is harmful when near the ground. Ozone levels are highest in summer, in the late afternoon. It may be particularly hazardous to children because they spend so much time running and playing outdoors. Ozone pollution can cause breathing problems in children with asthma.

- Restrict your child's outdoor activities when health advisories or smog alerts have been issued.
- Whenever possible, take public transportation, carpool, walk, or ride a bike instead of driving. This will help reduce the amount of air pollution caused by cars.

Insect repellent:

Outdoor activities are a great way for children to have fun and exercise. But these types of activities often include insects. Be careful about the insect repellents you use on your child. Most insect repellents include a chemical called DEET (diethyltoluamide). This chemical is absorbed into the skin and can be harmful to children.

- Choose an insect repellent that is made for children.
- Be sure any insect repellent used on your child contains a low level DEET (no more than 10%).
- Apply insect repellent to clothing when possible, rather than directly on the skin.

Lawn and garden fertilizers:

Some common lawn and garden fertilizers can be harmful if children come in contact with them while playing in the yard. Many of these products are made with chemicals (pesticides) that are known to cause health problems, especially in children.

- Use these chemicals only when needed.
- Read and follow the instructions carefully.
- Do not let your child play on a treated lawn until it has been watered twice and the odor of the pesticides has gone away.

Art supplies:

Arts and crafts projects are a fun way for children to learn. However, some art supplies can cause health problems in children who use them. While older children can usually use these products safely, most younger children and some children with disabilities cannot. Harmful art supplies can include:

- rubber cement
- permanent felt-tip markers
- pottery glazes
- enamels
- spray fixatives
- prepackaged papier maché
 - Use only "nontoxic" art supplies.
 - Read and follow all instructions carefully.
 - Always use products in a well-ventilated room.
 - Look for the ACMI "nontoxic" seal or other information on the label that says the product is safe for children.
 - Talk to your school to make sure only safe art supplies are being used.

Whether it is inside or outside, children love to explore their environment. This natural curiosity is an important way for children to learn. Be aware of the possible hazards that your child may face. Keep in mind that not all environmental hazards can be avoided completely and do what you can to reduce your child's exposure.

To learn more:

1. Environmental Protection Agency

Public Information Center

Room 311 West Towers,

Mail Code 3406

401 M Street, SW

Washington, DC 20460

202/260-7751

2. Food and Drug Administration

Consumer Affairs Room 16-75,

Mail Code HFE885

600 Fishers Lane

Rockville, MD 20857

800/532-4440

3. National Coalition Against the Misuse of Pesticides

701 E Street, SE

Washington, DC 20003

202/543-5450

4. American Lung Association

1740 Broadway

New York, NY 10019- 4374

800/LUNG-USA

5. Agency for Toxic Substances and Disease

Registry Public Information Office

1600 Clifton Road, NE

Atlanta, GA 30333

404/639- 0501

Literature on demand from the author (fax or e-mail)