

TOXIC SHOCK! 5 GREAT ARTICLES FREE

As a bonus – along with your 'Toxic Ingredients Desktop Directory' – We present this collection of 5 superb articles by diverse authors each concerned about the level of toxins prevalent in our lives today. Saving you hours of research time to get to the facts you need to know:

- 1) **Kyle Grimshaw Jones** – lays it on the line about 'trans dermal toxicity' – The fact that we absorb toxic substances through our skins is key to why we must change our personal care and cosmetics routines and buy safer alternative products.
- 2) **Robert Mesquita** – Explains that the toxins we absorb today could affect our family for years to come as a result of genetic damage and changes that can occur using products laden with toxic synthetic chemicals.
- 3) **Dr Joseph Mercola & Rachel Droege** – Outline the 10 most common toxins and the devastating effects they can have on you and your family's well-being. They also explain how to avoid the worst effects of these toxins by taking adequate precautions and changing your lifestyle and habits where necessary.
- 4) **Florence Williams** – New York Times article looks in depth at the shocking prevalence of toxins in breast milk – an increasing threat to our children's health that further confirms the need to choose safer skincare, and cosmetics as well as reducing our intake of chemically adulterated foods.
- 5) **An article from the Environmental Working Group (EWG)** – about the evidence that repeated exposure to chemicals in skincare and cosmetics adds up to a potential health threat. EWG also feature an excellent *skin-deep* section on their website that explains and assesses chemical risks in many common skincare and cosmetics products.

For safer alternative products that are 100% natural and certified organic to food grade standards visit: <http://www.saferalternative.com>

18 POINTS ON NATURAL SKIN HEALTH AND TRANSDERMAL TOXICITY

by

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1. Skin cells are composed of stratified epithelial tissue, very similar to the human digestive tract.
2. Skin cells require nourishment with nutrients that are useful to the cells, either as fuel or as structural material.
3. Skin cells require the drainage/removal of waste products produced by cellular metabolism or internal/external toxicity from food, water, air, or skin/scalp contact.

4. Therefore the absolute best way to achieve natural good healthy skin is to give it good nerve supply, lymphatic drainage, and a good clean nutrient-rich and healthy blood supply, while avoiding toxic chemical exposure.

5. The human skin is absorbent, just like the digestive tract, and therefore substances placed onto the human skin penetrate into the underlying tissues and eventually contact the blood where they circulate through vital organs. Herbalists have used this to advantage in the form of foot and hand baths for many years. Nicotine patches also work for this reason, and can provoke acute toxicity effects in people when overused for the same reason.

6. Substances placed on the skin can be grouped into three broad categories:

- (i) inert - not absorbable through the skin, not useful to human cells, non-toxic
- (ii) nutritive - useful to human cells for either nourishment or fuel
- (iii) toxic - not useful to human cells for either nourishment or fuel, and requiring either detoxification, or toxin-binding and static cellular storage to prevent them from circulating and causing ongoing damage.

The result of this static storage is localized intercellular toxicity, potentially predisposing to cellular changes like carcinogenesis, and teratogenesis. Toxins that undergo this type of storage are cumulative and build up over the years.

7. Millions of years of human cell evolution, exposure, and natural selection, has produced cells with a certain set of biological processes and capacities. Hence, exposure to certain groups of natural chemicals for many generations of humans and human cells has resulted in an excellent capacity to deal competently with these natural chemicals. The comparatively new wave of toxic chemicals in recent millennia/centuries, very recently often derived from material leftover from the petrochemical industry (imagine the waste disposal fees they can save paying when they can sell it as a product ingredient instead of paying for sealed landfill space!), are foreign to human cells. Enzyme pathways, and detoxification mechanisms do not exist for many or perhaps any of these, and it has been reported that toxicity effects from simultaneous multiple toxin exposure seem to be greater and more complex than the sum of many single toxin exposures owing to interactive and other effects.

8. In short, natural health advocates often say, very simply:

"IF YOU WOULDN'T EAT IT, DON'T PUT IT ON YOUR SKIN."

Whilst this may be slightly oversimplified, it is correct in essence.

9. Extremely short-term exposures to pure simple soaps (fat + alkali salt, e.g. olive oil + salts in wood ashes = castille soap) seem harmless.

10. Your scalp is part of your skin, your digestive tract is your inner skin, and your mouth, gums, tongue, eyes, sexual organ membranes, and conjunctiva are all also absorbent tissues made of very similar cells.

11. The transit of toxic chemicals through the skin surface into the body has been dubbed TRANSDERMAL POISONING, causing TRANSDERMAL TOXICITY, and occurs in both acute and chronic/cumulative forms.

12. Toxicity is a primary causative factor of disease in humans. To recover from illness or aspire to health, it is prudent to remove wherever possible any known sources of toxicity and harm from one's environment/lifestyle.

13. It is therefore prudent as an act of personal responsibility to carefully scrutinise what substances the surfaces of your body come into contact with. This includes all dental materials, hard soaps, liquid soaps, massage oils, dishwashing detergents (residue on dishes and hands), clothes-washing powders/liquids/dyes (residues on clothes), synthetic fibres (clothes and other), paints, stains, woodfinishes, cosmetics, shaving creams, deodorants, perfumes, shampoos, conditioners, lip balms, lip sticks, moisturizers, scrubs, toothpastes, tooth powders, mouthwashes, mascara, suncreams, skin creams, waxes, hair products, hair gels, body and foot powders, insect repellants, bathing water (can contain volatile chlorine and many other chemicals), bubble baths, bath salts, foot powders, body powders, foundation, make-up, spray/paste-on tans, bodywrap products, spa products, linaments, balms, poultices, compresses, tampons, sexual lubricants, sexual aids, Teflon cookware, food chemical additives, aluminium cookware, anticaking agents in commercially produced salt, and all other products used in internal or external body applications or that come into contact with living human cells.

14. Practitioners of natural and traditional medicine should carefully consider the code of ethics of their membership organisation. It usually contains a derivative of a sentiment from the Hippocratic Oath: "First do no harm." Practitioners should do their best to ensure that they do not breach this code of ethics by using toxic chemicals on their clients, or coercing clients to use them on themselves. Herbalists who make creams for their clients should avoid any petrochemicals or other toxic chemicals in the bases or other ingredients of their creams (Some say sorbalene fits into this category).

15. As a duty of care towards their customers and employees, all practitioners, employees, and businesses involved in marketing/producing/using/encouraging the use of products (and giving/encouraging treatments with these products), which contact human skin or tissue, would be wise to openly disclose to their customers and employees, and fellow employees, all the ingredients of these products, indicate anything reasonably known or suspected about their toxicity levels and cumulative toxicity effects, and obtain educated and informed consent from each and every customer and employee on each and every treatment/sale, with each and every product. Failure to do so could be viewed legally as a breach of duty of care or worse, and could incur significant legal liability. Class action suits are a possibility.

16. These toxins, after being applied to living human tissues, are washed into our sewers and water treatment facilities, and eventually leach and travel into the ground water and contaminate streams, estuaries, water catchments, the ocean and all its inhabitants, the polar ice cap and northern indigenous tribespeople, and eventually and potentially every being on the planet, cumulatively, through air and water movement patterns.

Perhaps the manufacturers and promoters of such products would like to ask permission of each and every planetary citizen and whether they mind?

17. If it be decided by a business or practitioner, after toxicity concerns are raised or toxicity information is offered, to continue using, promoting, and selling toxin-containing products and treatments with these toxin-containing products, this may be legally hazardous, and morally wrong. At the very least, it may be wise to obtain educated and informed consent, and offer an alternative completely non-toxic range of products as an option for each and every product known to contain toxins, for each and every employee, for each and every client, and for each and every treatment.

18. So what can you do?

**BEWARE OF THOSE WHO WOULD PROFIT FROM YOUR IGNORANCE OR
APATHY**

- Beware of false assurances in product advertising.
- Avoid toxic chemicals as much as you can.
- Don't assume anything is safe without first checking it thoroughly and assiduously. If someone wants you to buy or use a product, or wants you to buy a service from them that uses a product, and they haven't made this process of checking easy, ask them why they haven't. Ask to see the labels and ingredients of every product that anyone wants to use on you or sell you, and ask the salesperson, administration, and company owners what they are, where they come from, and how toxic they are. Read every product label, and every ingredient. Research every ingredient for yourself, if you don't know what it is, and find out why it is there, where it comes from, and how toxic it is.
- Supply a copy of this information to the person who wanted you to buy or use their product.

**BELIEVE YOU CAN DO ALL THIS FOR YOURSELF. TAKE PERSONAL
RESPONSIBILITY AND DON'T HAND OVER YOUR HEALTH TO THOSE WHO
WOULD PROFIT FROM YOUR IGNORANCE, APATHY, OR SELF-DOUBT.**

- Make your blood, healthy, clean, and well-nourished.
- Improve your blood circulation using natural techniques.
- Help your body detoxify.
- Write letters to companies asking why they are selling or producing toxic petrochemicals and other chemicals for people to use on their skin. Copy and distribute this document far and wide. Use it to teach friends, family, acquaintances, employees, employers, and other people about the dangers of transdermal poisoning.

- Collect literature about this topic from health magazines and anywhere else, and spread awareness of this wherever you can. (Email it to me!)
- Some companies justify their continued sale and production of these products by saying that it is legal and they are just supplying legitimate consumer demand. (Cigarettes carry warning stickers. Who cares about the environment or the consumers health!) Remove this consumer demand, vote with your money, and only support those companies which avoid toxic chemicals completely. There are a number of these companies in existence now, some with certified organic ingredients.

TRANSDERMAL POISONING MUST STOP!

Respectfully submitted,

Kyle Grimshaw-Jones

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For safer alternative skincare, hair care, body care and cosmetics products visit the educational and informative site at: <http://www.saferalternative.com>

Any questions about toxic synthetic chemicals in your personal care products and food, or about finding safer products mail: saferalternative@yahoo.co.uk

The Deadly Reach of Environmental Toxins Across Generations

By Richard Mesquita, AquaMD

(AquaMD is the water testing division of the American Water Council, a nationally respected provider of water education and testing services. AquaMD has teamed with Dr. Mercola to provide you with diagnostic services and the Dr. Mercola water testing packages at

<http://www.aquamd.com/mercola/labtests.cfm>.)

Did you catch the recent findings coming out of Washington State University and published in Science magazine? It showed how exposure to environmental toxins affects your health more than anyone ever imagined.

Researchers found [exposure to toxins in the environment by your parents or grandparents](#) may have caused you to inherit some of your ailments.

And, if you are exposed to environmental contaminants, you could pass on your exposure to generation after generation of your offspring.

For 60 years, scientists have known parents pass on genes to their children and grandchildren. Science has known, if parents passed on bad genes, their children and grandchildren would be more likely to suffer from diseases like cancer, diabetes and heart disease.

Now, scientists have found that disease may be caused not only because of your parents or grandparents passing on bad genes, but also because they were exposed to toxins 70 years earlier. And even though their cells weren't affected by that exposure, yours are.

In fact, Dr. Michael Skinner, one of the researchers involved with the study at Washington State University, said toxins may even chemically modify the person's DNA!

The Experiment

The experiment started four years ago by accident when one scientist was studying testes development in rats when they come into contact with environmental toxins. Hence, he exposed them to a common fungicide and a common pesticide. Another researcher accidentally allowed two of the exposed rats to breed. But instead of restarting the experiment, the scientists decided to let some time pass to see what happened.

They found the male developed genetic disorders, because of his exposure to the pesticide and fungicide, which was no big surprise. What did shock them: The next three generations of male rats also had the same ailment as the very first one who was exposed to these toxins. The study proved the toxins the rats were exposed to in the first generation were still detected four generations later.

Just as shocking was that the impact was not reduced in each of the four following generations, even though only the first generation was exposed to the contaminants.

The scientists didn't tell anyone about their findings and continued their study for the next two years to confirm their findings. They eventually came to the conclusion the evidence was irrefutable. And, Dr. Skinner also believed the study implies cancer and other diseases can be passed on in the same way -- from generation-to-generation.

What Does This Mean For You?

It means that it is more important than ever to guard against exposure to environmental toxins.

There are 6 million to 7 million chemical substances known in industry and scientific research, and close to 70,000 of them are regularly used in the industrial, agriculture and service sectors. The EPA also reports that 4.3 billion pounds of toxic substances are legally dumped annually into our nation's environment.

Recent studies have shown that even low doses of toxins have a much greater impact than was once thought.

This study also suggests that even those studies underestimated the impact. Why? Because the way in which damage caused by exposure to toxins has been measured may be wrong. As Dr. Skinner said, they didn't find "a change in the DNA sequence," but a "chemical modification of the DNA."

That's why it is so important to find out if your water supply contains even low levels of toxins that you are exposed to when doing things you'd typically take for granted, like showering, bathing and cleaning dishes. If it does, you can install the right treatment system to remove those contaminants. And you can also get help from your health practitioner to treat the damage done to your body.

How to Avoid the Top 10 Most Common Toxins

By Dr. Joseph Mercola
with Rachael Droege

There are many upsides to living in a modern, high-tech society (like having access to the Internet and [digital cameras](#) and [MP3 audio players](#) to name a few of my favorites.) But as with most things in life and in nature, whether you call it yin and yang, balance or the principle that opposites attract, with the upside comes a significant downside.

For all of the conveniences and advances that we have grown so accustomed to comes a slew of environmental toxins -- chemicals and other materials largely from industry and carelessness -- that have very much saturated our water, our food and the very air we breathe.

Many of these toxins are things that you can't see, smell or feel, at least not right away. One of the major problems with them is just that. We don't realize that we're being affected until we come down with a chronic disease after years of subtle and often consistent exposure to a combination of these toxins.

This makes it almost impossible to pinpoint a specific environmental toxin as the source of illness, yet when you look at the facts -- the increasing numbers of cancers, immune system disorders, neurological problems, chronic fatigue syndrome, multiple chemical sensitivities, allergies and hormonal disturbances that are facing the nation -- it is hard NOT to take notice. Consider these statistics:

- Some 77,000 chemicals are produced in North America
- Over 3,000 chemicals are added to our food supply
- More than 10,000 chemical solvents, emulsifiers and preservatives are used in food processing
- 1,000 new chemicals are introduced each year

Where do all of these chemicals end up? They are absorbed into our groundwater, rivers, lakes and oceans, spewed into our air, and added, quite intentionally, to our food supply.

The Effects of Toxins on Your Body

A study in last year's [British Medical Journal](#) estimated that perhaps 75 percent of most cancers are caused by environmental and lifestyle factors, including exposure to chemicals. Another report, this one by the Columbia University School of Public Health, estimated that 95 percent of cancer is caused by diet and environmental toxicity.

This is really not surprising when you consider that estimates show most Americans have somewhere between 400 and 800 chemicals stored in their bodies, typically in fat cells. Some of the short- and long-term effects of these toxins include:

- Neurological disorders (Parkinson's, Alzheimer's, depression, attention deficit disorder, schizophrenia, etc.)
- Enzyme dysfunction
- Muscle and vision problems
- Cancer
- Altered metabolism
- Immune system depression
- Nutritional deficiencies
- Reproductive disorders
- Allergies/Asthma
- Hormonal imbalances
- Fatigue
- Endocrine disorders
- Headaches
- Chronic viral infections
- Obesity
- Less ability to tolerate/handle stress

The 10 Most Common Toxins

The following toxins are among the most prevalent in our air, water and/or food supply. This list is by no means all-inclusive, as thousands of other toxins are also circulating in our environment. Keep reading to find out tips to avoid these toxins and others as much as possible.

1. **PCBs (polychlorinated biphenyls):** This industrial chemical has been banned in the United States for decades, yet is a persistent organic pollutant that's still present in our environment.

Risks: Cancer, impaired fetal brain development

Major Source: [Farm-raised salmon](#). Most farm-raised salmon, which accounts for most of the supply in the United States are fed meals of ground-up fish that have absorbed PCBs in the environment and for this reason should be avoided.

2. **Pesticides:** According to the Environmental Protection Agency (EPA), 60 percent of herbicides, 90 percent of fungicides and 30 percent of insecticides are known to be carcinogenic. Alarmingly, pesticide residues have been detected in 50 percent to 95 percent of U.S. foods.

Risks: Cancer, Parkinson's disease, miscarriage, nerve damage, birth defects, blocking the absorption of food nutrients

Major Sources: Food (fruits, vegetables and commercially raised meats), bug sprays

3. **Mold and other Fungal Toxins:** One in three people have had an allergic reaction to mold. Mycotoxins (fungal toxins) can cause a range of health problems with exposure to only a small amount.

Risks: Cancer, heart disease, asthma, multiple sclerosis, diabetes

Major Sources: Contaminated buildings, food like [peanuts, wheat, corn](#) and alcoholic beverages

4. **Phthalates:** These chemicals are used to lengthen the life of fragrances and soften plastics.

Risks: Endocrine system damage ([phthalates chemically mimic hormones and are particularly dangerous to children](#))

Major Sources: Plastic wrap, plastic bottles, plastic food storage containers. All of these can leach phthalates into our food.

5. **VOCs (Volatile Organic Compounds):** VOCs are a major contributing factor to ozone, an air pollutant. According to the EPA, VOCs tend to be even higher (two to five times) in indoor air than outdoor air, likely because they are present in so many household products.

Risks: Cancer, eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment

Major Sources: Drinking water, carpet, paints, deodorants, cleaning fluids, varnishes, cosmetics, dry cleaned clothing, moth repellants, air fresheners.

6. **Dioxins:** Chemical compounds formed as a result of combustion processes such as commercial or municipal waste incineration and from burning fuels (like wood, coal or oil).

Risks: Cancer, reproductive and developmental disorders, chloracne (a severe skin disease with acne-like lesions), skin rashes, skin discoloration, excessive body hair, mild liver damage

Major Sources: Animal fats: Over 95 percent of exposure comes from eating commercial animal fats.

7. **Asbestos:** This insulating material was widely used from the 1950s to 1970s. Problems arise when the material becomes old and crumbly, releasing fibers into the air.

Risks: Cancer, scarring of the lung tissue, mesothelioma (a rare form of cancer)

Major Sources: Insulation on floors, ceilings, water pipes and heating ducts from the 1950s to 1970s.

8. **Heavy Metals:** Metals like arsenic, mercury, lead, aluminum and cadmium, which are prevalent in many areas of our environment, can accumulate in soft tissues of the body.

Risks: Cancer, neurological disorders, Alzheimer's disease, foggy head, fatigue, nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels

Major Sources: Drinking water, fish, vaccines, pesticides, preserved wood, antiperspirant, building materials, [dental amalgams](#), [chlorine plants](#)

9. **Chloroform:** This colorless liquid has a pleasant, nonirritating odor and a slightly sweet taste, and is used to make other chemicals. It's also formed when chlorine is added to water.

Risks: Cancer, potential reproductive damage, birth defects, dizziness, fatigue, headache, liver and kidney damage.

Major Sources: Air, drinking water and food can contain chloroform.

10. **Chlorine:** This highly toxic, yellow-green gas is one of the most heavily used chemical agents.

Risks: Sore throat, coughing, eye and skin irritation, rapid breathing, narrowing of the bronchi, wheezing, blue coloring of the skin, accumulation of fluid in the lungs, pain in the lung region, severe eye and skin burns, lung collapse, reactive airways dysfunction syndrome (RADS) (a type of asthma)

Major Sources: Household cleaners, drinking water (in small amounts), air when living near an industry (such as a paper plant) that uses chlorine in industrial processes.

Tips to Avoid Toxins

It's impossible in this day and age to avoid all environmental toxins. What you can do, however, is limit your exposure as much as possible with the following tips:

- Buy and eat, as much as possible, [organic produce and free-range, organic foods](#). If you can only purchase one organic product it probably should be free range organic eggs. Fortunately most grocery stores now have these available. If they don't contact the store manager and encourage them to carry them. Additionally I believe [raw milk products](#) are a key to staying healthy. They are best obtained locally but many people have a great challenge finding them. I have made special arrangements with a dairy in the only state that raw milk products are legal, California, so [you can easily obtain them](#).
- Rather than eating fish, which is largely contaminated with PCBs and mercury, consume a high-quality purified fish or cod liver oil like [Carlson's](#). Contact your favorite health food store for it or another high quality brand or [use our store for your immediate](#) convenience. Another option is to have your wild-caught fish lab tested to

find out if it is a pure source (we've found a delicious [Alaskan wild red salmon](#) that is mercury- and PCB-free and safe).

- Avoid processed foods -- remember that they're processed with chemicals!
- Only use natural cleaning products in your home. Most health food stores will have these available or you can search on line for them.
- Switch over to [natural brands of toiletries](#), including shampoo, toothpaste, [antiperspirants](#) and cosmetics. Same sources here, either your local health food store or you can search on line.
- Avoid spraying insect repellants that contain DEET on your body. There are safe, effective and natural alternatives out there, like [Neem-Based Botanical Outdoor Gel](#).
- Remove any metal fillings as they're a [major source of mercury](#). Be sure to have this done by a qualified biological dentist. Although nearly any dentist is technically qualified to replace your amalgam fillings, far less than 95 percent have any clue on how to do it properly so your risk of mercury exposure is minimized. Please avoid the mistake I have seen THOUSANDS of patients make and have your fillings replaced by a non-qualified dentist. I made this mistake myself nearly 20 years ago. Do it right the first time and save yourself the expense and grief. If you don't personally know a qualified biological dentist, many people find one by contacting several of the health food stores in their area and asking the employees who they know. This is typically an excellent resource as they are usually networked quite well in the local health community.
- Avoid using artificial air fresheners, dryer sheets, fabric softeners or other synthetic fragrances as they can pollute the air you are breathing.
- Avoid artificial food additives of all kind, including [artificial sweeteners](#) and MSG
- Get plenty of safe sun exposure to boost your [vitamin D levels](#) and your [immune system](#) (you'll be better able to fight disease).
- [Have your tap water tested](#) and, if contaminants are found, install an appropriate water filter on all your faucets (even those in your shower or bath).
- Seek to build your health up through the nutrition insights detailed in my [Total Health Program](#), and then limit your use of drugs (prescription and over-the-counter) as much as possible. Drugs are chemicals too, and they will leave residues and accumulate in your body over time.

Sign up, and encourage your friends to too, for [the free Mercola.com e-newsletter](#), your premier source for the latest health insights.

Toxic Breast Milk?

FLORENCE WILLIAMS / NY Times Magazine 9jan05

If human breast milk came stamped with an ingredients label, it might read something like this: 4 percent fat, vitamins A, C, E and K, lactose, essential minerals, growth hormones, proteins, enzymes and antibodies. In a healthy woman, it contains 100 percent of virtually everything a baby needs to survive, plus a solid hedge of extras to help ward off a lifetime of diseases like diabetes and cancer. Breast milk helps disarm salmonella and E. coli. Its unique recipe of fatty acids boosts brain growth and results in babies with higher I.Q.'s than their formula-slurping counterparts. Nursing babies suffer from fewer infections, hospitalizations and cases of sudden infant death syndrome. For the mother, too, breast-feeding and its delicate plumbing of hormones afford protection against breast and ovarian cancers and stress. Despite exhaustion, the in-laws and dirty laundry, every time we nurse our babies, the love hormone oxytocin courses out of our pituitaries like a warm bath. Human milk is like ice cream, Valium and Ecstasy all wrapped up in two pretty packages.

But read down the label, and the fine print, at least for some women, sounds considerably less appetizing: DDT (the banned but stubbornly persistent pesticide famous for nearly wiping out the bald eagle), PCB's, dioxin, trichloroethylene, perchlorate, mercury, lead, benzene, arsenic. When we nurse our babies, we feed them not only the fats, sugars and proteins that fire their immune systems, metabolisms and cerebral synapses. We also feed them, albeit in minuscule amounts, paint thinners, dry-cleaning fluids, wood preservatives, toilet deodorizers, cosmetic additives, gasoline byproducts, rocket fuel, termite poisons, fungicides and flame retardants.

If, as Cicero said, your face tells the story of your mind, your breast milk tells the decades-old story of your diet, your neighborhood and, increasingly, your household decor. Your old shag-carpet padding? It's there. That cool blue paint in your pantry? There. The chemical cloud your landlord used to kill cockroaches? There. Ditto, the mercury in last week's sushi, the benzene from your gas station, the preservative parabens from your face cream, the chromium from your neighborhood smokestack. One property of breast milk is that its high-fat and -protein content attracts heavy metals and other contaminants. Most of these chemicals are found in microscopic

amounts, but if human milk were sold at the local Piggly Wiggly, some stock would exceed federal food-safety levels for DDT residues and PCB's.

Some of the chemicals I'm mainlining to my 1-year-old daughter will stay in her body long enough for her to pass them on to her own offspring. PCB's, for example, can remain in human tissue for decades. On a body-weight basis, the dietary doses my baby gets are much higher than the doses I get. This is not only because she is smaller, but also because her food -- my milk -- contains more concentrated contaminants than my food. It's the law of the food chain, and it's called biomagnification.

To refresh that lesson from seventh grade, here's how it works: Animals at the top of the food chain receive the concentrated energy and persistent chemicals of all the biota underneath them. Each member up the food chain takes in exponentially more fat-loving toxins than its counterpart below. This is why a slab of shark contains more mercury than its weight in plankton. Ocean food chains are longer than terrestrial ones, so people who eat many marine carnivores carry higher body concentrations of some chemicals than the vegan at your local salad bar. When it comes to these fat-soluble toxins, the Inuit are among the most contaminated populations on earth, even though they live in the remote Arctic. But don't picture Eskimo Woman in sealskin on the top of the food chain. Picture her suckling baby.

For a mother and child, nursing is perhaps the most intimate of acts. Evolutionary biologists call it matrotropy: eating one's mother. My daughter is not only physically attached to me; she is taking from me all that I can give her. Each time I lift my shirt, she pants and flaps her arms and legs as if it were Christmas. Then she settles in, both of us wholly reassured that this is the best, safest and most satisfying food she could eat. I nurse because, like many women, this is what I've been told by contemporary pregnancy books and my pediatrician. I want to give her the best possible start in an uncertain world.

I take this responsibility seriously, as most of us do; for her sake, I don't drink much alcohol or caffeine. I avoid spicy foods, strawberries and cruciferous vegetables, which are believed to cause gas in babies. I take my vitamins to ensure that I have enough calcium and iron. I don't smoke. I'm aware of concerns about pesticides and heavy metals, and I try to take precautions. Since I have been pregnant with or

nursing two children for almost four years, I have been buying mostly organic food. Several years ago we installed a three-stage reverse-osmosis filter on our tap water and ice maker. I live in a leafy, scenic town in the Rocky Mountains far from brown clouds and belching diesel freeways.

So it was with increasing discomfort that I scanned recent headlines about pervasive toxic chemicals, the ones you can't easily avoid. There were articles about elevated mercury levels in women of child-bearing age, federal actions against the makers of Teflon and flame retardants accumulating in breast milk. This last one especially frightened me. Not only was nature's purest food tainted by chemicals, but the act of breast-feeding itself, an act of love and nurture, was also now marred by fear. Had I been wrong to be so smug about the superiority of breast-feeding? Should I switch to formula, which contains plant-based fats and therefore lower levels of some contaminants (although it may contain higher levels of others, like aluminum and manganese, as well as the pathogens and pesticides found in tap water)? I learned that in general, older women have stored up more toxins than younger ones. Scientists believe that mothers siphon off to their baby a significant amount of their lifelong store of chemicals in the course of breast-feeding. Nursing a baby, it turns out, is the ultimate detox diet. I'm 37. What toxins have I passed on to my son and daughter?

To find out, I sent my breast milk off to be tested for certain flame retardants called PBDE's, reputed in some press reports to be "the next PCB," a class of industrial chemicals banned in the late 70's. I knew some PBDE's would turn up; they are found in virtually every animal and human tested so far. The milk of American women has the highest levels in the world, although still mostly lower (we think and hope) than levels at which health effects might be seen in us or our children. What these levels tell us is that our world is full of unhappy and improbable surprises, like the fact that the plastic in our computers and TV's somehow ends up inside us. Our collective levels tell us that the chemicals are increasing over time, that someone should be paying attention and that it would be helpful to know what havoc may be wreaked in our cells if present trends continue.

Waiting for results over the next two months, I learned more about chemicals in my everyday life. I began eyeing my degrading foam mouse pad: was I ingesting it? I read the ingredients label on my sunscreen. I noticed the little white pesticide-notification flags on my neighbors' lawns. I watched my 3-year-old son. Was he

meeting his development targets? How was his attention span? I recognized that in its incremental way, alarm over toxic contamination creates a perfect storm for the overanxious parent. Now in addition to worrying about the right schools, dirty bombs and car-seat recalls, we get to wonder if our mattresses are emitting developmental neurotoxins.

During this time, one thing became clear to me: we live in a flame-retardant nation. The reason is polyurethane. Originally used by the German Army in World War II, by the mid-50's the polymer was transforming everything from refrigeration insulation to upholstered foam furniture to car bumpers. It was an industrial miracle: cheap, soft and malleable. As one industry Web site puts it, "Today, polyurethanes can be found in virtually everything we touch -- our desks, chairs, cars, clothes, footwear, appliances, beds, the insulation in our walls, roof and moldings on our homes."

It has just one problem: it's highly flammable. Responding to strong consumer-protection laws dating from the 70's, manufacturers increasingly treated household foam and plastics with brominated flame retardants. The National Association of State Fire Marshals says that such fire retardants have saved hundred of lives from house fires. They also help prevent the release of combustion byproducts like dioxin, a known human carcinogen. PBDE's reflect a wholly modern conundrum: they are one toxic solution most of us didn't know existed to a toxic problem most of us didn't know we had.

For the flame retardant to work, foams, plastics and fabrics are mixed with, or coated in, PBDE's, polybrominated diphenylethers, but in such a way that the chemical is not molecularly bound to anything. It appears to migrate out of its product and attach to household dust. A class of so-called organic compounds, PBDE's have as one of their signature properties fat-solubility. Hence their unwelcome appearance in our breast milk. They may remain in humans for several months to at least several years. Semi-volatile in the environment, certain PBDE's have lately been found in soil sediments; in chicken, pork, sausage and dairy products; in sewage sludge and crop fertilizer; in fresh and saltwater fish; in wild birds; on computer and desk surfaces; in clothes-dryer lint; on the insides of residential windows; and in human fetal liver tissue.

Persistent toxins were first discovered in breast milk in 1951, when black mothers in Washington were tested for the pesticide DDT. In 1966, a Swedish researcher thought to test his wife's breast milk for PCB's, or polychlorinated biphenyls, after he discovered them in the tissue of a dead eagle. Five years later, Sweden banned PCB's, with the United States following a few years later. But because of those chemicals' widespread use and persistence, they are still the highest-concentration toxins in breast milk, even in mothers born after the 1978 ban. Most scientists maintain that prenatal exposure to PCB's -- considered by the Environmental Protection Agency to be a probable human carcinogen -- can do real damage. Researchers in the Great Lakes region, the Arctic and the Netherlands found that babies born to mothers with mid- to upper-range background levels of PCB contamination (probably because of diets rich in contaminated fish and animal products) have delayed learning capabilities, lower I.Q.'s and reduced immunities against infections. The longitudinal studies on which these findings were based showed that some problems persisted at least into early adolescence.

The message from these studies about breast-feeding, however, was not what you might expect. Although the children who were breast-fed had higher PCB levels than children who were exposed only in utero, they consistently performed better than those who drank formula. When researchers controlled for socioeconomic factors, the differences were more subtle but still there. In other words, breast milk appears to be at least partly protective against the effects of toxic chemicals. In fact, the World Health Organization and other groups continue to recommend breast-feeding for all women. At first this sounds reassuring, until you wonder how much better the breast milk would be without the companion chemicals. We'll never know, since an uncontaminated control group doesn't exist.

Swedish researchers first discovered the PBDE flame retardants in pike in 1981. Like PCB's, they concentrated in fat and stuck around. But unlike PCB's, whose levels were gradually declining worldwide, the flame-retardant levels were rising. The Swedes decided to look for the chemicals in stored human milk samples, and what they found rocked the scientific community: from the early 70's, when they first appeared commercially, to 1998, levels of PBDE's in breast milk were doubling every five years, a rate unmatched by any known chemical in the last 25 years.

"No one had ever heard of them -- we thought it was just a European problem," said Kim Hooper, a specialist with the California Department of Toxic Substances Control. "So our lab looked in San Francisco Bay seal blubber, and found a 100-fold increase over 10 years." When European scientists first saw the test results of American women, they thought there must be a mistake. Our levels were 10 to 100 times higher than those of women in Europe and Japan.

So far, little is known about the health effects of PBDE's in humans. It's difficult to experiment with human subjects, and so to estimate toxicity scientists look to laboratory animals. What they have found is that in rats, exposure to PBDE's has resulted in damage to the thyroid and its ability to orchestrate proper brain development, although the exact mechanism remains unclear. We know that the offspring of exposed rats suffer reduced motor function, and that some develop tumors at high doses of one type of PBDE. Several recent animal studies indicate that PCB's and PBDE's may act in unison to block protein receptors and affect thyroid and endocrine functioning.

Such observations can be useful in helping us determine toxic chains of events but not in predicting at what dose the bad effects occur in humans. And, as Paracelsus put it, the dose makes the poison. The dose required to harm a developing fetus or small baby is likely to be much lower than to harm an adult.

"No one at this time knows at what levels nursing is not the best approach and in fact becomes harmful to babies," said Arnold Schecter, at the University of Texas School of Public Health, the researcher to whom I sent my samples. "But such levels must exist."

Aake Bergman, head of the department of environmental chemistry at Stockholm University, whose data was instrumental in influencing the European Union to ban two formulations of PBDE's, said: "I hope I never will be able to tell you about effects in humans. We will so totally have failed if we see effects in humans."

When Congress ordered the banning of PCB's in 1976, it also passed the Toxic Substances Control Act, which authorized the U.S. Environmental Protection Agency to approve and regulate new chemicals. Approximately 58,000 existing chemicals

were grandfathered in, no questions asked, including PBDE's. Today, about 15,000 chemicals are used commercially in the United States. Under the law, manufacturers are required to submit any available information on the health and safety of new chemicals, and the Environmental Protection Agency has 90 days to assess it. Manufacturers are also required to submit available toxicity information as it becomes available on older substances. But with 2,000 new chemicals proposed every year and limited data to review, the agency is seriously behind the curve. Of chemicals used by children and families in consumer products, only about 25 percent have registered complete toxicity data. In nearly 30 years, the E.P.A. has required manufacturers to test about 1,500 chemicals, or 10 percent of the total, and flat-out rejected only a handful of chemicals.

"We don't like to see a chemical building up in the tissues of people," said Charlie Auer, director of the E.P.A.'s Office of Pollution Prevention and Toxics. With PBDE's, he said, "there certainly is a basis for some level of concern, but we don't have enough information." Still, in 2003 his office reached an agreement with the biggest manufacturer of PBDE's, Great Lakes Chemical Corporation, to stop producing two of three formulations by the end of 2004. Existing stocks of those two forms of the chemical will be used and eliminated "over time," he said.

And so I do what any mother would: I try to gain a sense of control. Not entirely happy about the exposed foam in my husband's old pick-up, I cover the rips with duct tape. I retire my son's adorable airplane-print foam chair to the garage. I even replace his questionable polystyrene beanbag with one made out of organic buckwheat hulls. But there's not much I can do about the television sets, computers, printers, coffee makers, carpets, roof insulation and the rest of it short of moving my family into a tree and sleeping on a horse-hair mattress.

To get a reality check, I call David Ropeik, a former environmental journalist now with the Harvard Center for Risk Analysis. "We're developing new and better tests to allow us to do more biomonitoring, but so what?" he asked. "It's really dicey to know what that means for human babies. The mom who lets her kids get sunburned and worries about PBDE's is worrying about the wrong thing."

Knowing what we carry inside us, rather than making anyone feel better, may in fact be making us feel worse. "Biomonitoring is now so refined that you can detect pretty

much anything," said Peter O'Toole, a spokesman for the industry-financed Bromine Science and Environmental Forum. "It's become a cottage business. We just want to see it done right, and not used as a scare tactic."

Fewer than 200 women have been tested in the United States for flame retardants in their breast milk, many of them for a study by Arnold Schecter. When he called with my PBDE results from the lab, he had mixed news. The good news in relative terms is that at 36 parts per billion, my levels are only 2 points above what Schecter's work suggests is the U.S. median. This means that roughly half of women tested have levels above mine and half below. The bad news is that my levels are presumed to be rising with the current trend and are still an order of magnitude higher than those of the rest of the industrialized world. At current rates of increase, my levels could reach 300 parts per billion in 10 to 15 years. That's the level that Tom McDonald, at the California Office of Environmental Health Hazard Assessment, says corresponds to endocrine and thyroid dysfunction in lab animals. What this means, though, in human terms, remains unclear. Talking about PBDE's, Schecter said, "We know less than one-tenth of one percent of what we know about PCB toxicity. Your level, and that of other American women, suggests to me that the E.P.A. still has a lot of work to do."

I called Michael Dourson, a toxicology consultant who is very familiar with the current research on PBDE's and children, to get a read on my own numbers. He translated my PBDE levels -- 36 parts per billion -- into an exposure estimate for my breast-feeding daughter and then compared that with the best-known safe level that scientists can more or less agree on. What it comes down to is that, roughly and with some uncertainty, my baby is receiving one-seventh the exposure of the maximum level believed to be safe. "Above that level, we're not sure, but we become less confident," he said. "And at some point, it becomes not safe."

After countries in Northern Europe began restricting certain flame retardants in the 90's, levels in breast milk there declined. That is what we hope to see here now that production of the two most worrisome flame retardants has ceased.

I'm relieved that my exposure levels aren't higher. I'm relieved that some of the substances are going off the market. And I'm relieved, frankly, to get back to worrying about trans fats and car seats. But there is a lingering unease that more toxic surprises await us. A few years ago, many American toxicologists had never heard of

polybrominated diphenylethers. Already, another chemical is ready to claim "the next PCB" label: PFOA, or perfluorooctanoic acid (used to make nonstick frying pans), believed by some to be an even bigger problem.

Ultimately, though, the question for me as a mother is not at what threshold of exposure will my baby be harmed, but why are we manufacturing common products made with these toxins at all? "There is almost no example of a toxic chemical in breast milk that doesn't have a nontoxic substitute," said Sandra Steingraber, a visiting scholar at Ithaca College and author of "Having Faith: An Ecologist's Journey to Motherhood." "We haven't yet compromised breast milk to such an extent that it's a worse food than infant formula, but why get to that point?"

For now, I will continue to breast-feed my daughter. As for PBDE's, McDonald said, "My hope is that we caught it early enough."

Florence Williams, a contributing writer for Outside magazine, writes frequently about environmental issues.

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For safer alternative skincare, hair care, body care and cosmetics products visit the educational and informative site at: <http://www.saferalternative.com>

Any questions about toxic synthetic chemicals in your personal care products and food, or about finding safer products mail: saferalternative@yahoo.co.uk

Exposures add up - Survey results

Published by Environmental Working Group (EWG)

June 2004. A personal care product use survey of more than 2,300 people, conducted by EWG and a coalition of public interest and environmental health organizations, shows that the average adult uses 9 personal care products each day, with 126 unique chemical ingredients. More than a quarter of all women and one of every 100 men use at least 15 products daily. Among the findings of this survey are the following:

12.2 million adults - one of every 13 women and one of every 23 men - are exposed to ingredients that are known or probable human carcinogens every day through their use of personal care products.

One of every 24 women, 4.3 million women altogether, are exposed daily to personal care product ingredients that are known or probable reproductive and developmental toxins, linked to impaired fertility or developmental harm for a baby in the womb or a child. These statistics do not account for exposures to phthalates that testing shows appear in an estimated three quarters of all personal care products but that, as components of fragrance, are not listed on product ingredient labels (EWG et al. 2002).

One of every five adults are potentially exposed every day to all of the top seven carcinogenic impurities common to personal care product ingredients — hydroquinone, ethylene dioxide, 1,4-dioxane, formaldehyde, nitrosamines, PAHs, and acrylamide. The top most common impurity ranked by number of people exposed is hydroquinone, which is a potential contaminant in products used daily by 94 percent of all women and 69 percent of all men.

Women use more products than men, and are exposed to more unique ingredients daily, but men use a surprisingly high number of products as well. The average woman uses 12 products containing 168 unique ingredients every day. Men, on the other hand, use 6 products daily with 85 unique ingredients, on average.

The personal care product industry's self-policing safety panel, the Cosmetic Ingredient Review, approaches each safety assessment as if consumers are exposed to just one chemical at a time, and as if personal care products are the only source of exposure for each chemical considered. The panel is often wrong on both counts.

The results of this survey in combination with other studies show that people are exposed to hundreds of chemicals over the course of a day (CDC 2003, Thornton et al. 2002, EWG 2003), and that people face multiple sources of exposure from multiple consumer products for some of the common industrial chemicals used as cosmetic ingredients. Exposures can add up. The industry's panel does not consider the reality of patterns of human exposures — additive effects of exposures to multiple chemicals linked to common health harms — in declaring chemicals "safe as used" in cosmetics.

By considering the human body to be a "clean slate" free of background contamination, free of related chemicals linked to common health harms, and free of exposures from other kinds of consumer products, the industry's panel will every time underestimate the potential for a particular personal care product ingredient to harm human health.

Survey methodology.

Personal care product use survey data collection. Between January and May 2004, six public interest and environmental health organizations conducted an in-depth survey on personal care product use, compiling information from more than 2,000 survey respondents. The groups involved in this effort included The Breast Cancer Fund, Women's Voices for the Earth, Health Care Without Harm, the Massachusetts Breast Cancer Coalition, Clean Water Action, and the Environmental Working Group.

These groups and some of their affiliated organizations distributed surveys in both paper and electronic form, through membership mailings and

organizational newsletters, and by canvassing college campuses, community forums, and high volume retail areas. Surveys were entered electronically; results were stored in a database housed at Environmental Working Group. The vast majority of surveys were collected in hard copy and entered electronically by the groups mentioned above. Some individual respondents chose to complete the survey online instead of on paper, in which case their responses were recorded directly into the database.

Personal care product use survey data analysis. Using Monte Carlo modeling techniques, EWG analyzed product use rates and ingredient exposure profiles from 2,335 valid survey responses (those for which all requested information essential to the analysis was completed). The model generated one million usage profiles from sequential, random selections of survey responses from among valid surveys. Using the frequency of use, product type, and brand of product, we selected products from our product database to match the survey response. When our product database did not contain the brand identified by the survey respondent, we randomly assigned the person a product of that type. From the one million generated usage profiles, we generated statistics on the ingredients contained in the products these usage profiles indicated, as well as statistics on the toxicity profiles of those ingredients.

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