



KILLER

HOW SEEMINGLY INNOCENT CLOTHING
CHOICES ENDANGER YOUR HEALTH...
AND HOW TO PROTECT YOURSELF!

CLOTHES

Anna Maria Clement, PhD, NMD, LN
and Brian R. Clement, PhD, NMD, LN
Co-Directors, The Hippocrates Health Institute

Contents

Introduction: Why the Emperor Wears No Clothes

Chapter 1: Tight Clothing's Link to Health Problems

Chapter 2: Chemical Clothes Surround Us

Chapter 3: Health Effects of Synthetics

Chapter 4: We Are All Guinea Pigs

Chapter 5: Fabric Care That Creates Toxins

Chapter 6: Dressing Yourself and Others Safely

Chapter 7: The Dangerous Future of Clothing

Appendix

References

About the Authors

INTRODUCTION: Why the Emperor Wears No Clothes

As a young girl growing up in Sweden, I (Anna Maria) often heard a Scandinavian folk tale about two swindlers pretending to be weavers who convinced an emperor to purchase clothes made from a material of such high quality that they were “invisible to any man who was unfit for his office or unpardonably stupid.” Though the emperor realized that he couldn’t see his new clothes, he refused to admit this to anyone out of fear he would be considered stupid or unfit to rule. The emperor’s attendants and subjects similarly played along and pretended they could see the clothes.

When the emperor wore his new “clothes” in a public procession, it fell to a little child to exclaim, “He has nothing on at all.” This innocent observation broke the spell so that everyone in the kingdom could admit to themselves and to each other that the reported clothes were nothing but a delusion. This parable, “The Emperor’s New Suit,” by nineteenth century author Hans Christian Andersen, should hold new levels of meaning for us today. Pride, vanity, and stubborn denial, all on display in this story, also characterize our real-life clothing choices. Our Western culture’s refusal to recognize an uncomfortable reality about the clothes we wear carries with it documented threats to personal health and environmental well-being.

Synthetic-fiber clothing is worn with an illusion of safety but hides invisible chemical and other dangers that clothing manufacturers and much of the world’s health-care industry ignores, or attempts to rationalize away. The “emperor” that rules most wardrobe choices today is fashion. This emperor is worshipped at an economic altar on which considerations of health and safety have largely been sacrificed. Only in recent times have humans faced a fashion versus safety dilemma. Ornamenting the human body, whether with paint or tattoos or clothing, seems to have always been our natural impulse, but it was usually a secondary consideration to comfort and protection from the elements.

Humankind’s earliest clothing may have consisted of leaves and grass matted together and draped around the body, followed later by the use of animal hides to provide protection from sunlight, heat, cold, and the other elements of nature. Some of the earliest sewing needles made from ivory and bone have been carbon-dated to about 30,000 BC by archeologists, so we know that for much of human history the production of clothing from animal and plant sources was labor intensive and time consuming. All of that changed dramatically with the Industrial Revolution of the late eighteenth and early nineteenth centuries, a period in which the textile industry was mechanized so that the mass production of clothing became both possible and profitable.

Natural fibers such as cotton, flax, wool, and silk remained the mainstays of

this industry until the petrochemical revolution of the twentieth century resulted in the creation of synthetic fibers in chemical laboratories. Perhaps the most restrictive and unsafe item of clothing introduced in the name of fashion during the nineteenth (or any other) century was the corset. It squeezed women's bodies and crushed their internal organs, even displacing their ribs, until women could hardly breathe or move without experiencing pain. These virtual straitjackets were worn because many women chose to believe these garments made the feminine form more shapely and desirable to men.

There were some notable dissenters to the corset fad and the overall Victorian infatuation with restrictive clothing. A late nineteenth century British group called the Rational Dress Society—whose membership included Mrs. Oscar Wilde, wife of the satirist and writer Oscar Wilde—campaigns against corsets and tight clothing, and advocated the adoption of a style of dress based upon considerations of health. When it was founded in 1881, the group issued a position statement that could still be used today as a guideline for how to choose safe clothing: “The Rational Dress Society protests against the introduction of any fashion in dress that either deforms the figure, impedes the movements of the body, or in any way tends to injure the health.”

Synthetics Displace Natural Fibers

In virtually all areas of life during the twentieth century, synthetics replaced naturally derived consumer products. Nowhere, with the possible exception of cosmetics and personal care products, was this trend more pronounced than in clothing and fabrics manufacturing. Rayon, introduced in 1924, was the first artificial textile fiber, though variations of this wood-based compound, including cellulose acetate, had been in use since the previous century. But the first truly synthetic fiber was nylon—its petro-molecule source being toluene—whose introduction in 1939 made the mass production of parachutes for use in World War II a less expensive alternative to silk.

In that same year, vinyon, a polyvinyl chloride, was created to bind non-woven fabrics. DuPont chemist Wallace Hume Carothers, generally credited as the inventor of nylon, also probably deserves the title of father of the synthetic textile industry. Following the creation of nylon, which found its most popular consumer use in women's stockings (panty hose), a series of new synthetics were developed and introduced into mainstream fashion:

- Acrylic and modacrylic in 1950. These “wash-and-wear” fabrics, which often replace wool in sweaters, were considered to be a revolutionary timesaving leap for homemakers, especially those who washed clothes by hand.

- Polyester in 1953. These “wrinkle-free” fabrics, developed from xylene and ethylene, further reduced the amount of clothing made from cotton, particularly men’s suits.

- Spandex and olefin in 1959. Sports clothes and bathing suits were the prime uses for stretchable spandex. Sportswear and thermal underwear were made from olefin, which is produced by “cracking” petroleum molecules into propylene and ethylene gases.

The vast majority of clothing items produced in the world today—constituting a \$7 trillion a year industry—are either manufactured, or the fabric fibers are grown, using synthetic chemicals, many of which are toxic to human health. As a further challenge to health and safety, most of the cleaning agents used to wash or dry clean clothes contain chemicals that can trigger adverse physical symptoms. These effects on health should be particularly worrisome for parents with babies and young children—who often place clothing in their mouths and then chew and suck on the fabric—because the natural detoxification systems of children’s bodies aren’t fully developed enough to quickly or completely eliminate fabric chemicals.

According to The Ecologist magazine, an estimated eight thousand chemicals are employed to transform raw materials into clothes, a process that involves bleaching, dyeing, scouring, sizing, and finishing the fabrics. Synthetic clothing now commonly contains such toxins as formaldehyde, brominated flame retardants, and perfluorinated chemicals like Teflon fibers to give trousers, skirts, and other apparel “noniron” and “nonwrinkle” durability. (Perfluorinated compounds are classified as cancer-causing agents by the U.S. Environmental Protection Agency guidelines.)

Insecticides are even being applied to fibers in the name of protecting health. The latest clothing craze, which we will detail in chapter 7, takes nanoparticles and adds them to garments, though scientific evidence that these microscopic particles can harm human, animal, and plant life is accumulating.

Health Impacts Are Accumulating

The entire history of synthetic fibers and synthetic clothing amounts to only about six decades of production and use. The era of synthetic clothing really began affecting mainstream wardrobe choices in the 1960s, which means the chemicals used in their production have been in contact with human skin for just a half-century. Consider what has happened to human health in the industrialized world during that half-century, when synthetic clothing began touching the skin of mainstream consumers. Can it be merely coincidence that, according to the World Health Organization, the industrialized parts of

the world have experienced the following:

- Up to one-third of married couples today experience fertility problems.
- Respiratory diseases have increased by 160 percent among preschoolers in Europe and North America.
- Contact dermatitis and other skin ailments have become widespread.
- Our risks of contracting cancer have escalated until one in two males and one in three females will develop this disease in an average lifetime.
- If you're a woman, you now have a one-in-eight chance of developing breast cancer in an average lifetime. For postmenopausal women, the rate of breast cancer has escalated by 22 percent over just the past three decades.

Our own experience with the three hundred thousand guests who have visited The Hippocrates Health Institute over the years bears out these statistics. Once natural-fiber clothing began to be replaced by synthetics in the 1970s, we started seeing increasing numbers of guests showing up with breast cancer, prostate cancer, and a range of allergic conditions. That trend has accelerated with each passing decade as natural-fiber clothing disappeared from store shelves.

It became apparent to us at Hippocrates that the addition of chemical clothing to underlying chemical problems already existing in the body creates even more chronic and serious health problems. Human-made petrochemical fibers restrict and suffocate the skin, our largest and most sensitive body organ, making it unable to breathe properly so it can release toxins. Most people don't realize that our skin is our body's most important eliminative organ. By some estimates, we release a pound of toxins every day through our skin, assuming that it's allowed to vent as nature intended.

If we hold back any percentage of these toxins from being released, they accumulate in body fat and body organs to become like a time bomb, primed to detonate as some future health malady. Many of the impacts on health from chemicals used in synthetic clothing are being documented in medical journal studies, but these reports rarely receive mainstream media attention. To give just one illustration, contact dermatitis and other allergenic effects caused by skin exposure to synthetic clothing "is not only more frequent than previously thought," according to a 2003 study in the medical journal *Dermatology Online*, "but is also increasing."

This probably comes as news to you because that study, like so many others dealing with the health consequences of synthetic clothing, failed to receive

the public attention it deserved due to the “Emperor’s New Clothes syndrome,” that wall of silence and denial surrounding the fashion manufacturing industry. In *Killer Clothes*, that wall of silence will be breached as we reveal the many ways that synthetic clothing, chemicals added to garments, and tight clothing and tight shoes create acute problems for human health. Here are just a few examples of our findings:

- Medical evidence has emerged that the longer a woman wears a bra, especially a tight one, the greater her chance of developing breast problems, including breast cancer.
- Synthetic fibers pose such a fire and burn hazard that the U.S. Marine Corps prohibits its troops in Iraq from wearing synthetic clothing while off base.
- Medical studies have found that synthetic fibers help to induce muscle fatigue and muscle motor disorders, which for competitive athletes can mean the difference between winning and losing.
- Studies have determined that synthetic fibers produce electrostatic discharges and, as a result, the wearing of tight synthetic clothing and undergarments contributes to infertility in men.
- Permethrin is being added to civilian outdoor wear and military uniforms even though no tests have been conducted of this insecticide’s long-term impact on human health.
- Silver particles called nanosilver are being applied to name-brand clothing lines as antiodor, antiwrinkle, and antistain agents, though medical studies raise serious doubts about their safety.

Clothing manufacturers and even many toxicologists choose to believe that absorbing tiny amounts of toxic chemicals from individual items of clothing cannot be harmful to you. That often-repeated argument will be addressed in this book in several different ways. First, we don’t just absorb synthetic chemicals one at a time during the average day. We are exposed to hundreds of chemicals as a result of using a wide array of consumer products on our skin that contain synthetic ingredients, particularly cosmetics and personal care products. Many of these same chemicals are used in synthetic clothing.

That means we absorb tiny amounts of chemicals repeatedly from multiple sources until they add up and reach a tipping point within us that could be harmful. Second, the rationalization that “the toxin levels are too small to inflict harm,” as repeated by representatives of the synthetic clothing industry, fails to take into account the role of chemical synergies and their impact on

health. While some individual chemicals alone may not endanger your health, when chemicals from multiple sources combine and interact inside of your body, they can have unpredictable and potentially powerful effects with health consequences. These synergistic processes constitute the “black hole” of ignorance within the fields of toxicology and preventive medicine.

A Return to Safe Clothing

Is it too much to expect that the clothing we allow to touch our skin should be as natural and safe as it can possibly be? Shouldn't we be as concerned about wearing toxic chemicals as we are about ingesting or inhaling toxins? Our freedom to choose and wear natural versus synthetic clothing has narrowed over the past few decades because the lower costs of synthetics have crowded natural fibers out of the marketplace. That's why the United Nations Food and Agriculture Organization declared 2009 to be the International Year of Natural Fibres.

The need to revive and promote the sustainability of natural clothing industries worldwide came about because, as the U.N. group declared on its website, the natural fibers industry “has lost a lot of its market share due to the increased use of synthetic fibers.” But as we will explain in this book, all of us retain the power to minimize risks to our health by taking simple precautions and practicing mindfulness about our clothing choices and the buying options that we still have.

Killer Clothes will help to guide you in making those important decisions by presenting lists of safe products and safety-conscious manufacturers that still value consumer health over easy profits. Killer Clothes also documents how synthetic clothing impacts much more than just our personal health and well-being. Chemical clothing affects the health of the entire planet, from the toxic production methods used, to the chemicals employed in the cleaning of these items, to clothing disposal practices that allow these non-biodegradable products to continue to harm the environment long after their users have ceased to exist.

German chemist Michael Braungart and American architect William McDonough, authors of the 2002 book on ecologically intelligent design, *Cradle to Cradle: Remaking the Way We Make Things*, described how “textiles are quite literally woven into the fabric of life,” but our reliance on dangerous synthetics has steered us into a toxic blind alley. “The industry that launched the Industrial Revolution has long illustrated some of its most notorious design failures,” they wrote. “About one half of the world's wastewater problems are linked to the production of textile goods, and many of the chemicals used to dye and finish fabrics are known to harm human health.”

“Often, the clippings from fabric mills are so loaded with dangerous chemicals they are handled like toxic waste,” Braungart and McDonough point out, “while the products made from these materials are considered safe for use in the home.” The same troubling double standard holds true for all synthetic clothing—the dangerous chemicals used to produce them are considered toxic by manufacturers and public health institutions, but the clothing produced with these chemicals is treated as safe for use on human skin.

The choices we face as consumers and stewards of the Earth should be stark and clear. Organically grown natural fibers pose few threats to human health, whereas chemical fibers and synthetic clothing contribute to a long list of documented human ailments and degenerative conditions for the planet. Energy for the production of natural fibers comes from the sun, a renewable resource, whereas energy used to produce synthetic fibers comes mostly from fossil fuels, which generate multiple types of environmental pollutants that help to accelerate global warming.

You’ve heard it said that we become what we eat. If so, then we also become what we choose to wear! With synthetic clothing, we literally absorb some of the chemicals used in their manufacture. Safe clothes made from natural organic fibers, by contrast, help to produce healthy bodies and healthy minds. It is our hope that you will find this book to be a useful resource that will help you to navigate this toxic minefield. Together we can build a healthier future for all.

CHAPTER 1: Tight Clothing’s Link to Health Problems

Bras May Be a Breast Cancer Trigger

What if everything you thought you knew about bras and breast cancer turned out to be wrong? Can you question your long-held assumptions and personal habits, but more importantly, make necessary lifestyle corrections that will protect and improve your health? Is putting your “chest eggs in a tight nest,” as breasts in bras are sometimes equated, really necessary or even healthy? These are the kinds of questions that Dr. Elizabeth R. Vaughan began asking herself and her patients over a decade ago. Her background and upbringing isn’t that of someone who might ordinarily be expected to become a maverick health-care provider, much less one who challenges conventional health wisdom with passionate conviction.

She’s the daughter of two physicians, a descendant of four generations of physicians, and her great-grandfather was president of the American Medical Association. But her provocative outside-the-mainstream ideas about bras, toxins, and breast cancer prompted USA Today to call her “the Erin

Brockovich of medicine.” You might recall Erin Brockovich as the legal crusader who defied conventional wisdom and exposed the toxic contamination of an entire town, and whose story was later told in a movie starring Julia Roberts. What Dr. Vaughan, CEO of Vaughan Medical Center in Greensboro, North Carolina, began to notice was a relationship between the development of breast lumps and cysts and the wearing of bras.

She personally treated more than one hundred women who, in her words, “chose to go bra free after yet another biopsy of a lump in their breasts or aspiration of a cyst. Over three to six months, their breast cysts and lumps got smaller and less tender, and they developed no new lumps that we could detect.” Dr. Vaughan’s observation has since been demonstrated in practice by other health-care providers. Breast cysts may be one of the flashing red warning signs for the onset of breast cancer. A 1999 study in the prestigious British medical journal *The Lancet* examined 1,374 women with breast cysts and tracked them based on their incidence of breast cancer.

It was found that premenopausal women with breast cysts had a nearly six-fold increased risk of breast cancer compared to women who didn’t have breast cysts. Here is how the authors of this study succinctly summarized their findings: “Women with breast cysts are at an increased risk of breast cancer.” That shouldn’t come as a surprise given that most women wear bras that are much too tight for them and have worn them this way since they received their first training bra as a young girl.

According to the Johns Hopkins Breast Center, “as many as 80 percent of women are actually wearing a bra that is the wrong size for them,” a chronic condition that can produce health problems, particularly in the backs of women with large breasts. With a connection possibly established between breast cysts and breast cancer, along with Dr. Vaughan’s findings that bras cause or exacerbate the development of breast cysts, you don’t need to be the Sherlock Holmes of common sense to grasp that bras, lymphatic drainage impairment, breast cysts, and breast cancer may be linked, much like a chain reaction automobile wreck.

A key circumstantial piece of evidence showing a link between bras and breast cancer emerged in 1991 from a study of breast size and breast cancer risk by researchers in the Department of Epidemiology at the Harvard School of Public Health. Published in the *European Journal of Cancer*, this survey of thousands of women found that “Premenopausal women who do not wear bras had half the risk of breast cancer compared to bra users.” The study authors speculated that this could be because these premenopausal women are “thinner and likely to have smaller breasts.”

But that observation received little or no support from subsequent medical

studies. As the director of the Johns Hopkins Breast Center declared in 2007: “Simply having breasts and being female places all women at risk. Women with size 32AA bras get breast cancer just like someone with 46DDs.” This Harvard study finding about bra usage and a higher risk for breast cancer should have set off alarm bells within the health field and the clothing industry. At the very least, it should have spawned a spate of new studies exploring this connection between bra use and breast cancer. But it caused barely a ripple in public health awareness. Once again, as in the “Emperor’s New Suit,” reflexive rejection and obstinate denial triumphed over reality and common sense.

More Evidence Accumulates

Medical Anthropologist Sydney Ross Singer began to notice that when his wife removed her bra, both of her breasts were “outlined by dark red lines, marking the areas around her breasts and over her shoulders. The lines had been left by her bra.” This observation came in the wake of his wife’s discovery in 1991 that she had a suspicious lump on her breast. Their search for medical answers gave rise to a series of questions that in turn spawned a theory—could the constrictive nature of the brassiere have suppressed her lymphatic system, the internal network of blood vessels that flushes toxins from the breasts and other parts of the body?

Can toxins accumulate in breast tissue as a result of this constriction, and can that accumulation in turn trigger the growth of breast lumps and even the onset of breast cancer? To test their theory, Singer and his wife designed and carried out a Bra and Breast Cancer Study of 4,700 women, ages thirty to seventy-nine, who were interviewed in five U.S. cities—New York, Dallas, Phoenix, Denver, and San Francisco. About half had been diagnosed with breast cancer, the other half had no breast cancer diagnosis.

The questions asked of each woman included: Does your bra ever leave red marks on your skin or cause irritation? How long do you wear your bra each day on the average? During what stages in your teenage and adult life did you not wear a bra? Striking differences emerged in the answers given by the breast cancer and noncancer groups regarding bra usage and bra comfort. Only 1 percent of the cancer group wore their bras for fewer than twelve hours a day, compared to 20 percent of the noncancer group, who wore bras fewer than twelve hours a day.

Eighteen percent of the cancer group wore their bras to bed, compared to just 3 percent of the noncancer group. There were other statistically significant differences between the two groups. Only 4 percent of the cancer group had breast-fed their children, for instance, compared to 14 percent of the noncancer group. Almost zero percent of breast cancer victims regularly went

braless before their diagnosis, versus 5 percent of women in the noncancer group who regularly went without bras. Here is how Singer calculated the cancer risks from bras based on the study results:

- There is a six-fold greater incidence of breast cancer among women who wear a bra all day and to bed than among the general population.
- Going braless results in twenty-one-fold reduction in breast cancer.
- Breast-feeding affords three and one-half times the protection against breast cancer. One reason may be that breast-feeding stimulates greater drainage within the lymphatic system of the breasts, helping to prevent the accumulation of toxins. This observation is in line with other study findings that women who have never given birth have a higher incidence of breast cancer.

Though not proving a link between bra usage and breast cancer, this study nonetheless produced evidence suggesting that Singer's theory could have merit. "Breast cancer may be caused by the combined effects of toxins and bras on breasts," Singer concluded in the book *Dressed to Kill: The Link Between Breast Cancer and Bras*. "Bras are not the cause of breast cancer, but they may be a trigger for it." Other circumstantial support for Singer's theory comes from cultural observations made in the book *Cancer on Five Continents*, published by the International Association of Cancer Registries in France.

Women with the lowest incidence of breast cancer live in cultures where bras are not part of traditional wardrobes. These cultures include populations in parts of India, Israel, and Singapore, as well as some American Indian tribal groups. As a follow-up to their U.S. study, Singer and his wife did a survey of bra use and breast cancer in Fiji, where an estimated half of all women adhere to cultural tradition and refuse to wear Western-style bras. A Fijian health ministry official told the couple that their bra and breast cancer theory made sense because "our working women are now getting breast cancer. They are the ones who wear bras."

The Singers examined several dozen case histories of breast cancer among Fijian women, and every woman turned out to have broken from cultural norms to become a bra wearer. "We found that, given women from the same village (genetically related), with the same diet, the ones who developed breast cancer were the ones who wore bras," reported Singer and Grismaijer in 2007. Mainstream practitioners of Western medicine continue to reject the idea of any possible connection between bras and the occurrence of breast cancer. They do so, for the most part, reflexively, without ever having examined the evidence.

Dr. Marissa Weiss, writing in Prevention magazine, made this bold claim without citing any medical studies: “It’s not true that wearing a bra, especially underwire bras, traps toxins by limiting lymph and blood flow in your breasts, increasing risk.” A similar claim, once again without supporting medical documentation, was made by Lillie Shockney, Administrative Director of the Johns Hopkins Breast Center (funded by the Avon Foundation), who wrote in her December 16, 2008, health column for Yahoo.com: “This is a myth that needs to finally be put to rest.

Having a bra that is too tight, too small, underwired, or filled with air pockets or water doesn’t contribute to someone developing breast cancer.” Shockney’s column drew numerous responses from readers on Yahoo who challenged her with the same question: How do you know?

Other Medical Research, Linking Bras and Disease

The heavier her bra material, the hotter a woman’s breasts become, and this elevated breast temperature may contribute to the onset of breast cancer. This was the conclusion of a 1978 study in The Lancet by Dr. John M. Douglass of Los Angeles. He based his conclusions on examining several hundred women in his medical practice. Bras increase breast pain and discomfort, but when women discontinue wearing bras, the pain decreases or disappears. Two British breast surgeons, Dr. Simon Cawthorne of Frenchay Hospital in Bristol, England, and Dr. Robert Mansel of the University of Wales Medical School, studied one hundred women for three months to see if going bra free lessened breast pain.

The findings were conclusive—a majority of premenopausal women did improve their breast health and comfort as a result of going bra free. Pressure on the breasts from bras can elevate the core temperature of the body and suppress the production of melatonin, an important antioxidant for immune system health. Melatonin also has anticancer properties that are useful in preventing breast cancer. In 2000 that was the finding of two researchers at Japan’s Nara Women’s University who studied and measured the sleep-wake cycles of ten women, aged eighteen to twenty-three, to document the effect of bras on body temperature and melatonin levels.

In 2002 six other Japanese researchers did a study that documented how skin pressure as a result of wearing bras affects the autonomic nervous system in a harmful way. “Our data indicate,” wrote the researchers in the Journal of Physiological Anthropology and Applied Human Science, “that the higher clothing pressures exerted by a conventional brassiere have a significant negative impact on the autonomic nervous system activity, which is predominantly attributable to the significant decrease in the parasympathetic

as well as the thermoregulatory sympathetic nerve activities.

Since the autonomic nervous system activity plays an important role in modulating the internal environment in the human body, excess clothing pressures caused by constricting types of foundation garments on the body would consequently undermine women's health." Beginning in 1967 a series of studies in the Journal of the American Medical Association and elsewhere documented how bras that are manufactured with spandex fibers can cause skin problems in some bra wearers due to contact with the chemicals used in the production process that remain in the garments.

Meet The Breast Toxins

Breast cancer specialists are in general agreement that about 85 percent of the two-hundred thousand women in the United States who are diagnosed with the disease each year have no inherited genetic predisposition, which means that unhealthful lifestyle choices and the absorption of environmental pollutants account for the vast majority of breast cancer cases. Many health-care professionals fail to take into account that human skin, the body's largest organ, acts as a highly absorbent carrier for chemicals that come into direct contact with our body's "miracle garment," as skin is often called.

Common chemicals that can regularly come into contact with your skin and be absorbed by body tissues include the ingredients in cosmetics and personal care products, as well as chemicals used in the manufacture of synthetic clothing. When toxins enter the body through the mouth and end up in the intestines, they are channeled by the blood into the liver, where detoxification naturally occurs. When toxins are absorbed through the skin, however, they bypass the liver.

In fact, as toxicology specialist Dr. Samuel Epstein states in his 2009 book, *Toxic Beauty*, about toxins in cosmetics and personal care products, medical evidence exists that human skin is even more permeable than the nutrient-absorbing intestines, which makes skin the primary way that toxins invade the body. "As difficult as it might be to believe," wrote Dr. Epstein, a professor emeritus at the University of Illinois and founder of the Cancer Prevention Coalition, "mainstream manufacturers and regulatory authorities appear unaware of the high permeability of skin, or else simply choose to ignore this as a critical concern."

The list of possible chemicals that could be accumulating in women's breasts as a result of their skin exposure to everyday products and clothing is a lengthy one. Let's start with preservatives called parabens that are found in deodorants and antiperspirants and have been incriminated as a probable cause of breast cancer. A 2004 study in the Journal of Applied Toxicology

examined concentrations of parabens in human breast tumors and found a high correlation. As Dr. Epstein commented, “Parabens’ presence in breast tissue on its own incriminates them as a possible cause of breast cancer, but they have also been shown to stimulate the growth of estrogen-sensitive breast cancer cells in laboratory tests.” Triclosan is a second type of personal care product preservative that has been shown in laboratory tests to induce hormone disruptive effects that could trigger breast cancer.

Triclosan is often found in antibacterial soaps, deodorants, and other consumer goods, but most alarming, it’s also increasingly being added to synthetic clothing to prevent bacterial growth. Surveys conducted by Greenpeace International and other environmental and consumer groups have detected triclosan in a high percentage of umbilical cord blood samples and in the breast milk of half of all women that the groups tested, so we know this chemical bioaccumulates in the body easily and persists in the body over time. Detergents, called surfactants, appear in consumer products as cleansers but also are used in the production of textiles and clothing.

One of these detergents, a nonoxynol known as 4-NP, has been lab tested in animals and found to trigger the development of breast cancer. A 1994 study published in the medical journal *Endocrinology* concluded: “Long-term exposure to 4-NP could leave individuals at a significantly increased risk of developing breast cancer.” This chemical and some other related surfactants have been banned or severely limited from use in the production of clothing by the government of Norway out of concern for the impact on human health, yet these chemicals are still commonly used in the United States and most of the rest of the world.

Or consider the role played by the ingredients in most brand-name shampoos. A carcinogen called 1,4-dioxane, which is readily absorbed through the skin, contaminates an entire category of ethoxylate detergents—any with “eth” in their names, such as myreth and oleth—and this contaminant was listed in the medical journal *Cancer’s* 2007 review of carcinogens as a producer of breast cancer in rodent testing. In February 2007 a Los Angeles Times article reported that eighteen personal care products tested by an independent laboratory found high levels of dioxane.

Still another concern for women should be the ingredients in brand-name antiperspirants. A 2006 study published in the *Journal of Applied Toxicology* found evidence that aluminum chloride, used in high concentrations in most antiperspirants, is a hormone disruptive chemical that could trigger the onset of breast cancer. Study author Philippa Darbre, PhD, expressed concern that aluminum chloride in antiperspirants is absorbed through the underarms and can accumulate in the adjoining breast tissue. Professor Darbre also brought up the issue of chemical synergies from multiple chemicals in personal care

products acting together inside the body. “Each of these agents on their own may not have a powerful effect,” she wrote, “but we need to see what happens when a number of them act together. It could be that this would have a significant effect on diseases like breast cancer.”

Lymph System Is Key in Toxin Removal

As women absorb the chemicals mentioned above from skin contact with consumer products and synthetic clothing, the toxins accumulate in breast tissue, so the theory goes, and remain there because constrictive bra use prevents the breast’s lymphatic system from draining properly. That could be one of the triggers for the development of breast cancer. Consider how there are three primary steps or stages to this theory. Step one, toxins that can cause cancer, such as those in consumer products, are absorbed by the body.

They then accumulate in fat tissue because fat tissue attracts toxins like a magnet. A woman’s breast tissue is mostly composed of fat cells, so toxins tend to be stored there. Step two, the body’s lymph system plays a role, along with the liver, in removing toxins. If the lymph system fails to play its designated role effectively, toxins get stored in fat cells for too long, and that triggers the development of cancer cells. Step three, because your body’s lymph system is reliant on passive forms of fluid propulsion like movement and exercise (unlike your heart, which drives blood through your vessels), the lymph system is sensitive to outside physical pressure.

Since there are lymph pathways and lymph nodes in your armpits, under your breasts, and between your breasts, a tight-fitting bra can squeeze those areas and prevent proper drainage of lymph fluid that might ordinarily carry away toxins stored in fat cells. If you’re a woman, the next time you remove your bra after a day of use, try standing in front of a mirror and note the position of the strap marks. (If you’re a man, take note of these marks on your wife or significant other.) The more your bra was designed to mold your breasts into a particular shape, the more apparent these strap marks will be.

This is visual evidence of how breast constriction interrupts drainage from the lymphatic system of your breast tissue. Add to this constriction and immobilization an elevation in breast temperature, especially on hot days, combined with extended bra use, and guess what may happen? Your stored stew of toxins gets cooked inside of you. On the website www.breastnotes.com, the relationship between the constrictions of breasts inside bras and the impairment of lymphatic drainage is addressed this way: “Unsupported breasts (of any size) will most likely move when the woman is walking or moving about.

This is a natural movement, and there seems to be a reason for it. We have breast massage articles from several experts that address the question of breast movement and its relationship to the natural flow of lymphatic fluids in the breasts. Since there is no 'heart' to move the lymphatic fluid, we must rely on body movement and muscular contractions to move the fluid."

More Skin Problems Caused by Bras

Hundreds, if not thousands, of women began complaining in 2008 that their bras were creating serious rashes and even scarring of the skin on and around their breasts. "My bra kept me burning and itching and gave me a horrible rash," reported sixty-six-year-old Jerilyn Amaya of West Palm Beach, Florida. "I finally stopped wearing the bra and the symptoms disappeared." Ms. Amaya and more than six hundred other women across the United States joined in federal lawsuits filed in Florida, New Jersey, and New York against Victoria's Secret and its parent company, Limited Brands Inc., accusing the manufacturer of "negligently designing undergarments and misrepresenting the safety" of their products.

Specifically, the lawsuits alleged that Victoria's Secret bras contained formaldehyde resins at levels harmful to human health. When the bras are heated in a clothes dryer, according to the lawsuits, formaldehyde embedded in the fabric of the bras is released. Toxicologist Patricia Williams told the Associated Press in April 2009 that "this is not a little clothing rash" caused by the bras. She said, "The extent and severity of it is just unbelievable. Many of (the plaintiffs) have scars that seem to be permanent." A spokesperson for Limited Brands replied that testing of their bras showed "only small traces" of formaldehyde that "wouldn't cause any health problems."

Furthermore, said the spokesperson, the company doesn't intentionally add formaldehyde to its bras. At least two medical studies can be cited as offering some support for the crucial role that your lymphatic system plays in preventing, lessening, or triggering breast cancer. In a December 2002 issue of the medical journal *Lymphology*, researchers presented study findings showing how normal breast lymph drainage is an important predictor of whether a woman with breast cancer will survive. If a breast cancer patient's lymph vessels are obstructed, her chances of survival were rated as poor, whereas women with normal breast lymph drainage had a 30 percent higher survival rate.

The second study was conducted in Britain and was summarized this way in an October 31, 2000, edition of the *Sunday Telegraph* (London): "Wearing a bra exposes women to a 'statistically significant' risk of increased breast pain, cysts in the breast and might even be linked to the development of cancer." One hundred women who regularly suffered from breast pain or breast cysts

were asked to go bra free for three months. A significant number reported a reduction in their symptoms during this period. The newspaper further reported that the scientists in this study “suspect problems are caused by bras suppressing the lymphatic system—the network of vessels that flushes toxic waste from the body.

Professor Robert Mansel, a professor of surgery at the University Hospital of Wales, said the garments appear to be compressing the body at the outer upper part of the breast—the area where 80 percent of the lymph flows.” This study was considered particularly important in Britain because an estimated 40 percent of women in that country complain of breast pain and breast cysts. Breast-feeding provides a form of insurance against breast cancer by helping to stimulate lymphatic system circulation within breast tissue. A breast-feeding advocacy group, La Leche League International, compiled a list of medical studies on its website, www.llli.org, that supports this point of view. Here are a few representative examples of those study findings:

- About 1,432 new cases of breast cancer each year in the state of California are attributable to women having never breast-fed their babies, and a simple lifestyle change of breast-feeding, or lengthening the duration of breast-feeding, could prevent many cases of breast cancer, according to a June 27, 2006, study article in the journal BMC Cancer.
- Longer duration of breast-feeding could “reduce breast cancer risk significantly,” according to a German study of 706 breast cancer cases, published in February 2003 in the International Journal of Epidemiology.
- The incidence of breast cancer among women in developed countries could be reduced by half, from 6.3 to 2.7 cases per hundred women, if breast-feeding today were as common as a century ago, and the longer a woman breast-feeds, the more protection against breast cancer she is afforded, concluded a July 20, 2002, study published in The Lancet.
- Finally, a 2001 article in the American Journal of Epidemiology, titled “Long-term Breastfeeding Lowers Mother’s Breast Cancer Risk,” determined that women who breast-fed a child for more than two years had a 54 percent reduced risk of developing breast cancer compared with women who breast-fed for fewer than six months. This protective effect was found to exist both before and after the onset of menopause.

What Have You Sacrificed for Fashion?

Most women who we come into contact with on a daily basis share this experience and opinion of bras—they are uncomfortable, they unnecessarily restrict movement and blood flow, they impede our skin’s ability to breathe

and release toxins, and instinctively we know that bras and the bra industry are doing harm to women's bodies. So why do women wear them? Brassieres are a relatively recent development in the history of women's clothing, having been patented in 1914 by Mary Phelps Jacobs to be an alternative to the corsets that had contorted and restricted women from the waist to chest ever since they first became popular during the 1500s in Europe.

Breast Massage Helps Remove Toxins

Lymphatic drainage massage (LDM) is a manual technique that you can perform on your own to help keep your breasts free of cysts, lumps, and cancer. While any form of massage to the breasts may assist lymphatic flow, LDM differs from regular therapeutic massage in several respects. The strokes of your hand on your breast should be light and superficial in LDM, should be performed slowly, and should manipulate the breasts in alternating clockwise and counter-clockwise directions for the maximum and most beneficial fluid release.

Because bras lift and shape the breasts upward in sometimes provocative ways, our culture came to view them as a kind of sexual garment. Hollywood in the 1940s and '50s used movie icon Jayne Mansfield and other starlets to further market bras as sex appeal enhancers. That public perception of sexuality contributed to bras becoming the wearer's statement of style and fashion, irrespective of whether the undergarments served any real practical function.

The clothes you wear may shorten your life and impact your health.

Did you know that:

- Wearing a bra, especially a tight one, can increase your chance of developing breast cancer.
- Synthetic fibers are such a burn hazard that the U.S. military prohibits troops from wearing them off base.
- Man-made fibers in sportswear can reduce an athlete's competitive edge.
- Close-fitting synthetic underwear can contribute to infertility in men.
- Adequate testing has not been done to determine whether fabric additives, such as insecticides and metals, can safely be in constant contact with human skin.

Man-made clothing fibers, such as nylon, spandex, and Teflon, have only replaced cotton, wool, and silk over the last sixty years. During this time there's been a significant increase in health problems that may be associated with wearing synthetic garments: fertility problems, respiratory disease, contact dermatitis, and cancer.



Killer Clothes reveals the many ways that synthetic clothing, chemicals added to garments, and tight clothing and tight shoes create dangerous problems for human health. Dr. Anna Maria Clement and her husband Dr. Brian Clement, codirectors of The Hippocrates Health Institute, document the rise in health problems that has paralleled the increased use of synthetic clothing fibers. They intend to create wider awareness of the many medical studies—which the media has mostly ignored—showing the harmful consequences to health of wearing synthetic clothing.

Learn:

- what fabrics and chemicals to watch for when selecting clothing
- how to identify deceptive synthetic fabrics
- why to avoid any garment that is advertised as being antishrink, antibacterial, antimicrobial, antistatic, antiodor, antifiame, antiwrinkle, or antistain
- the advantages for choosing natural fabrics
- tips for ecological and health-friendly cleaning

HIPPOCRATES
HEALTH INSTITUTE

"Helping People Help Themselves"



Your purchase supports our commitment to using post-consumer recycled paper and plant-based inks.

\$14.95 US • \$17.95 CANADA

ISBN 978-1-57067-263-7



5 1 4 9 5



9 781570 672637

