



A Step-By-Step Guide to Reducing Your Risk of Breast Cancer



BREASTCANCER.ORG

Breastcancer.org is proud to work with the Lankenau Medical Center, Stonyfield Farm, the Lufkin Family Foundation, the Segal Family, and the Healthy Consciousness Foundation to provide *Think Pink, Live Green*. Working together we can make an even bigger difference to help families protect their breast health and reduce their risk of breast cancer.

Now is the time to reduce our risk

After decades of progress in improved diagnostics, better treatments, a deeper understanding of genetic risk factors, and stronger support networks, breast cancer still remains the most common cancer in women [1]. And what's even more concerning: **the overall incidence of breast cancer is projected to double globally by year 2040 [2] and occur more frequently in younger women [3, 4].** Now, more than ever, we need to focus our efforts on finding ways to reduce the risk of breast cancer.

With so many lives at stake, we urgently need to provide girls and women with timely education about established lifestyle risk factors, as well as emerging environmental hazards that may also increase the odds of developing breast cancer. To succeed, it's going to take a movement—we call it **Think Pink, Live Green**.

“It’s critical for women and girls to learn what they need to know about how to reduce their risk of breast cancer so they can make the best choices in their everyday lives.”

Marisa C. Weiss, M.D., Director of Breast Health Outreach and Breast Radiation Oncology, Lankenau Medical Center, President and Founder, Breastcancer.org

Think Pink, Live Green.

There is a lot we all can do to help lower the risk of getting breast cancer. But first, we must be willing to rethink many everyday choices and change old habits. We have to be more careful about what we eat, drink, breathe, take, and use from the kitchen, pantry, cleaning shelf, and medicine chest. We also need to address our challenges: how much we weigh and exercise; how we handle reproductive choices, stress, and many other aspects of our lives. Many of these factors affect how our outside environment impacts the inside environment within our bodies.

Think Pink, Live Green is your guide to help reduce your risk of developing breast cancer. It is grounded in science and medicine, and delivered in clear terms with easy-to-follow steps. We are certainly not starting from scratch. *Think Pink, Live Green* represents the results of ongoing research to identify both well-established and newly suspected breast cancer risk factors [5, 6]. Many of these factors can be reduced or modified by changing our daily lives. Every woman is at risk for breast cancer; some are more prone than others. But sometimes risk can be random. Even slim vegetarian yoga instructors with no family history get breast cancer. All of us need to take steps to lower our risk. Together, we can make great strides toward the goal of prevention.

The biology of breast development

From the beginning...

Women's breasts are more vulnerable to cancer than are our other organs, probably because of the unique ways they are built and function. The process of breast development lays down the foundation for our future breast health. Much of what we eat, drink, breathe, use, and take into our bodies could become the building blocks of our breast tissue [5, 6].

Under construction...

Breast development has two main phases. Both are extra sensitive to lifestyle and environmental factors [7-12].

- **Before birth**

The first important stage of breast development occurs when a baby is developing inside its mother's womb [8, 9, 11-13].

- **Adolescence**

Most breast tissue develops during adolescence. The breasts don't reach their final size, however, until the early twenties [9, 11, 13]. These changes unfold over about 10 years. Pregnancy is required before the breasts are able to make milk. In contrast, other organs form in the womb and are ready to function after birth.

Through the process of breast development, DNA has to be copied before new breast cells can be made. During this delicate process, breast cells—like all other cells—are prone to develop new genetic abnormalities, called mutations. Some of these mutations can increase the risk of breast cancer. For example, adolescent girls and young women exposed to significant doses of radiation are at higher risk of breast cancer later in life [5, 6, 9]. Some scientists think that breasts are more vulnerable to cancer than other organs are because it takes breasts much longer to develop.

Daily operations...

Breast tissue is also sensitive between the completion of breast development and the first full-term pregnancy [5, 9, 11]. Even when breasts appear fully formed on the outside, the cells on the inside don't mature completely until women go through a full-term pregnancy. Immature breast cells are more active and responsive to hormones than are mature cells. Estrogen is a hormone that can "turn on" breast cell growth. Long-term exposure to extra estrogen or chemicals that act like estrogen can increase breast cancer risk [5, 9, 10, 12, 14-16].

A full-term pregnancy makes your breast cells fully mature so they will be ready to work for the first time, at making milk. Final maturation occurs during breastfeeding. Anything that prolongs the time until the first full-term pregnancy may increase the risk of breast cancer later in life.

By knowing how breasts develop and function, we can better understand how they're affected by established and emerging breast cancer risk factors.

A major public health problem

The breast is the most common place for cancer to occur in women.

Breast cancer is the most common cancer to affect women, often occurring in the prime of their lives. And the incidence of breast cancer has substantially increased over the past 50 years, ever since cases have been carefully tracked [17]. This increase is only partly because women are living longer, allowing more time for cancers to develop, or because more women are getting mammograms, resulting in more cancers being detected. In fact, there is growing evidence that many other factors are contributing significantly to the rise in breast cancer cases. Today, we know we have a major public health problem that is rooted in a number of new realities.

A breast cancer risk factor = something that increases the odds of developing breast cancer, such as having an inherited genetic mutation, taking extra hormone medications, and being exposed to particular chemicals.

Many people think breast cancer is all about family history and inherited genes. While it is true some women inherit one or more abnormal genes that make their breasts more prone to cancer, these abnormal genes only increase the RISK of developing breast cancer. They don't CAUSE cancer by themselves [10]. For breast cancer to develop, other genetic changes still have to occur [4, 18, 19]. Also, today's higher incidence of breast cancer is not because the breast cancer genes are more common or have recently changed. They have been stable for a long, long time [20].

Genetic risk factors

Some women inherit a mutation in genes called BRCA1 and BRCA2, producing a high risk of breast cancer. These mutations are responsible for less than 10% of all breast cancer cases [3, 5, 10]. Breast cancer risk can also be increased by mutations in multiple other genes that work together. These genes, which are more common, are present in about 20-25% of all breast cancer cases, but only produce a small to medium increase in risk [21-24].

Breast cancer incidence has increased because modern life has changed the environments both outside and inside our bodies.

Major differences between modern life and life a half-century ago help to explain why breast cancer is more common today. Here we highlight 12 new realities of modern life that represent established risk factors for breast cancer, or raise serious new concerns about breast cancer risk. Each new reality involves the interplay between the internal environment of our bodies and the external environment of our outside world [5].

Modern life has changed the way we live

New Reality #1

More women are living longer

Today's women are living longer than ever before. On average, women are living nearly 30 years longer than they did a century ago [25]. And while that's good news for us in general, it's not such good news for our breasts. Aging is the biggest risk factor for breast cancer. The longer we live, the more we have to weather the wear and tear of everyday living [26]. Our genes are more likely to develop new harmful mutations and we are less able to repair the genetic damage [27]. If important genes stop functioning normally, then abnormal cell growth, such as cancer, is more likely to occur.

New Reality #2

Puberty and breast development are starting earlier and earlier

The earlier a girl gets her first period, the higher her risk for breast cancer later in life. Girls who get their periods at age 16 have a 50% lower risk of breast cancer as adults than do girls who get their periods before age 12 [9, 28-30]. Between the mid-1800s and 1950s in the U.S., the age for when girls reach puberty dropped, and then stabilized for several decades. This first drop was mostly due to better nutrition and improved lifestyle [31]. But in the past two decades, many more girls have started puberty even earlier [29, 30]. Earlier onset of puberty is also happening around the world. Today, some girls start puberty as early as 7 years old—a disturbing trend for many reasons [29, 30, 32].

The production of estrogen and other hormones brings on the onset of puberty. Breast development is usually the next step. The earlier breasts are formed and the longer they are exposed to stimulating or altering substances, the higher the risk of breast cancer later in life [5, 9, 29, 30].

New Reality #3

More women are delaying pregnancy or are not having full-term pregnancies

Pregnancy rates have been declining steadily. In fact, since 1990, the average number of pregnancies has declined each year by about 1% [33].

A woman's first full-term pregnancy protects against breast cancer by making the breast cells mature. Mature breast cells are more likely to grow normally and are less likely to become abnormal and give rise to cancer [34].

New Reality #4

Fewer women breastfeed and more women breastfeed for less time

Less than 20% of American women follow the American Academy of Pediatrics (AAP) and the World Health Organization (WHO) recommendation that infants should be fed only breast milk for the first 6 months [35]. And while 3 out of 4 new mothers in the U.S. start out breastfeeding, relatively few women are still breastfeeding 6 months later and even fewer breastfeed exclusively [36].

Breastfeeding further lowers the risk of getting breast cancer by forcing breast cells

to become even more mature. As with pregnancy, breastfeeding also causes genetic changes that protect against breast cancer [10, 37].

New Reality #5

More adolescents and women take prescription hormones

Some hormone medicines have been linked to a higher risk of breast cancer in women who are currently using them or who have recently stopped using them [37-39]. Hormone replacement therapy and birth control pills have been used for nearly half a century [37, 38]. Hormone replacement therapy to reduce menopausal symptoms produces a moderate increase in risk, and birth control pills are linked to a small increase in risk [38, 40]. Taking these extra hormones can cause extra breast cell growth and promote the growth of breast cancer. The longer we take these medicines, the higher the risk [41]. Many adolescents and young women start using oral contraceptives earlier and stay on them longer, often for reasons other than preventing pregnancy [38]. Many postmenopausal women still take hormone replacement therapy—some for extended lengths of time.

New Reality #6

More women and girls are overweight or obese

Obesity is an epidemic of modern life and an established breast cancer risk factor [9, 42, 43]. Over the last 30 years, rates of obesity among U.S. children and adolescents have tripled. Nearly 20% of girls ages 12 through 19 are now obese [44]. Over a third of American women are obese [45]. Extra weight and obesity can increase the risk of breast cancer in multiple ways [46-48].

Overeating increases body fat and promotes food cravings, leading to more eating. Fat cells make estrogen, and the extra fat makes extra estrogen. Fat can also collect and store many environmental pollutants that can act like estrogen. Diabetes is more common in obese individuals. This condition involves high levels of blood sugar and insulin-type hormones. Taking big “doses” of high-calorie foods on a daily basis can trigger some of the same changes. All of this extra hormonal activity can turn on too much breast cell growth, possibly increasing the risk of breast cancer.

Obesity is also associated with chronic inflammation of our cells and tissues. Inflammation produces chemicals that can damage our cells and make it harder for the immune system to function properly to heal the damage. Unrepaired cell damage may increase the risk of breast cancer [49].

In addition, overweight mothers are more likely to have overweight babies. Being heavy at birth is a risk for breast cancer later in life [50]. Overweight girls are more likely to experience early onset of puberty [29]. And obese individuals tend to eat less healthy foods and be less physically active.

New Reality #7

More women and girls are physically inactive

Modern life limits our physical activity, with working long hours, relaxing in front of the T.V., surfing the web, and driving to most places. Many of us don't get the exercise we need to be healthy. Regular exercise can help lower the risk of breast cancer in a number of ways. It helps us manage our weight by burning more calories, limiting food cravings, and improving self-image. Exercise also helps regulate hormone and blood sugar levels that can

trigger extra cell activity. Plus, regular exercise can help postpone the onset of puberty in some girls [51, 52].

New Reality #8

More women consume alcohol

Alcohol use by women has increased [53]. More women drink, and greater amounts of alcohol are consumed. Over 14% of American women drink moderately (an average of 3-7 drinks a week) or heavily (an average of more than 7 drinks a week) [54]. Alcohol can both interfere with the breakdown of estrogen and increase the production of estrogen [55]. It can also make the estrogen receptors inside breast cells more sensitive to estrogen. Longer and greater alcohol use in women produces more harmful effects, leading to a higher risk of breast cancer [10, 56-58]. In girls, alcohol use is associated with a higher rate of benign breast changes than in girls who don't drink [59]. Some of these non-cancer changes are linked to a higher risk of breast cancer later in life.

New Reality #9

Many women still smoke

Beyond the strong link between smoking and lung cancer, smoking produces a small increase in breast cancer risk [10, 60]. Smoking causes double trouble both by causing cell damage and by impairing the healing process. Unhealthy, cancer-causing chemicals from smoke go to all parts of the body. Blood vessels are narrowed, blood flow is reduced, toxins build up in tissues, and cell damage occurs. And to make matters worse: the body has less ability to repair this everyday damage. Unfixed cell damage can increase the risk of cancer.

New Reality #10

Many women have low levels of vitamin D [61]

Some studies show a possible link between low vitamin D levels and a higher risk of breast cancer [62, 63]. But even in the absence of a proven connection, low vitamin D levels are a real concern relative to breast cancer risk.

Vitamin D helps regulate normal breast cell growth [64]. Our main source of vitamin D comes from sun exposure: the sun activates vitamin D in your skin. Modern life keeps us indoors, working, using the computer, watching T.V., and catching up on housework. But with little time outdoors, it's easy to become vitamin D deficient. And while sunscreen helps protect our skin from skin cancer, it can also lead to lower vitamin D levels [61].

New Reality #11

Many women are stressed and sleep deprived [65]

Modern life is exhausting. The extra demands of going to school, getting and keeping a job, running a household, and being active in the community extend our days, shorten our nights, and wear us down. And many of us take care of everyone else and neglect our own health needs.

Ongoing stress and sleep deprivation raise serious concerns about our overall health and breast cancer risk. Extra stress leads to high blood levels of the stress hormone cortisol. High levels of cortisol can have a negative effect on our immune system's ability to function properly and protect our cells from injury [66-68]. We need quality sleep to

function well, keep our immune system strong, and repair and heal the wear and tear of everyday living. So far, stress and sleep deprivation have no proven link to breast cancer risk. But only limited studies have been done. Some studies show a possible connection between extra light at night and a higher risk of breast cancer [5, 69]. This may be due to lower levels of the sleep hormone melatonin [70, 71]. Melatonin production is activated by darkness and helps promote normal cell growth [5].

New Reality #12

Women and girls are exposed to more environmental pollutants

The widespread use of synthetic (man-made) chemicals in modern life has dramatically changed the chemical makeup of the environments inside and outside of our bodies [12, 72-75]. But the impact of these chemicals on breast health has only been partly studied and early evidence raises serious concerns. Some pollutants can directly damage our genes. Others can mimic estrogen or disrupt the normal hormonal balance and lead to abnormal breast cell growth [5, 12, 29, 74-78].

The 2008-2009 Annual Report of the President's Cancer Panel on Reducing Environmental Cancer Risk states, "A growing body of research documents a myriad of established and suspected environmental factors linked to genetic, immune and endocrine dysfunction that can lead to cancer and other diseases." [6].

An increased risk of breast cancer is most likely to result from exposure to chemicals during breast development and sensitive daily cell operations [5, 6].

Pollutants are everywhere

Since the 1940s, we have been exposed to a rapidly increasing number of synthetic chemicals [5, 6, 73]. More than 80,000 different chemicals are now used in manufacturing, agriculture, and consumer products to combat pests and infection, add convenience, save money, and increase productivity. But many of these chemicals can have harmful effects on both our inside and outside environments [79]. We are exposed to environmental pollutants in many different ways. These chemicals can leak into the land, water, and air of our outside environment. They can also get into the environment inside our bodies through the food we eat, the water we drink, the air we breathe, and in the cleaning and personal care products we use.

In the foods we eat and the water we drink...

Food is usually a main exposure to chemicals from the outside environment. Water and other drinks represent real but lesser sources of exposure [5, 6, 73, 80, 81]. Many chemicals used in agriculture and food processing can get into our food [82, 83]. In addition, many of these chemicals can also wash off farmlands, landscaped areas, and backyards, and enter our water supplies [84]. Once inside our bodies, some of these chemicals can weakly mimic estrogen or other kinds of our own natural hormones. For example, of the 200 pesticides tested in 2004, 25% are able to produce weak estrogen effects [75].

Human and animal studies show that exposures to several widespread pollutants during early breast development can significantly increase the risk of developing breast cancer

later in life. Thus, babies in the womb and girls in adolescence appear to be particularly vulnerable to effects of hormonally active pollutants [5, 11, 12, 76].

Did you know...

- Some of the most widely used weed killers can “turn on” the production of estrogen or disrupt normal hormonal balance [85-87].
- Washing or peeling fruits and vegetables removes some, but not all, pesticides [88]. The U.S. Department of Agriculture Pesticide Data Program found as many as 13 different pesticides on one pint of well-washed non-organic blueberries [89].
- Many beef and dairy cattle farms inject extra hormones into their animals to increase meat and milk production and save money, yet the safety of these hormones for consumers is still controversial [90-93]. While lower prices make these products more accessible, we don’t yet know how our health may be affected by consuming food produced this way.
- Preventive antibiotics are given to food animals to help them avoid infection. These antibiotics can lead to more antibiotic-resistant infections in people [94]. Dealing with difficult-to-treat infections weakens your immune system’s ability to heal cell damage.
- Active ingredients in healthy foods like soy are sometimes manufactured into concentrated supplements. These products can contain high levels of ingredients with estrogen-like activity, which might contribute to the development or growth of breast cancer. It is important to know that the content and quality of these products is often unregulated.
- Many unused medicines are thrown out or flushed down the toilet and can get into surface and ground waters. Prescription hormones, which are eliminated by the body, can also get into the water. While effects of these chemicals have been found on fish and other wildlife, the levels do not appear high enough to affect humans. Still, there are serious concerns about safety [80, 81, 84, 95].
- Chemicals used to disinfect water often become common water pollutants themselves [96].
- Oil spills pollute the water supply and eventually the land. Spills contain chemicals that can directly damage genes in breast cells [79, 97, 98].
- Some pollutants can concentrate in plants and animals as they move up the food chain [99].

In the air we breathe...

Smoking pollutes the air you breathe and is a risk factor for breast cancer [10, 60]. Second-hand smoke may have the same negative effect.

Flame-retardant furniture, carpeting, floor sealants, vinyl wallpaper, paints, and other building materials can release chemicals into the air within your home and workplace. Some of these chemicals have been linked to an increased risk for breast cancer [79]. Popular consumer products, such as air fresheners and scented candles, also release chemicals into the air. Air pollution from automobiles, other forms of transportation, and manufacturing can negatively affect our health as well. While many of these chemicals have no proven link to breast cancer, there is real concern about their safety. They can tip the normal balance of hormones and produce other adverse health effects [5, 6, 76-79].

“The breast is a sponge for everything in the environment.”

**Jose Russo, M.D., F.A.C.P., Breast Pathologist
and Scientist, Fox Chase Cancer Center**

In the products we use...

Many personal care products, such as shampoos, lotions, cosmetics, and perfumes, contain chemicals whose safety has not been fully tested. And what goes *on* us can go *in* us. Ingredients such as fragrances, preservatives, and hormone extracts can be absorbed into the body. Some of these chemicals have been shown to increase the risk of breast cancer in laboratory animals [79]. We can also absorb chemicals from everyday products used in our homes, on our pets, on the lawn, and in the garden. Some of these chemicals may have an unhealthy effect on our cells, possibly contributing to the risk of cancer [5, 6, 12, 79, 100, 101].

Most plastics release some amount of chemicals into the food and drinks they contain, especially when containers are heated or re-used many times. Chemicals released by plastics #3, 6, and 7 can be especially harmful. A hormonally active chemical found in #7 plastics (bisphenol A, also called BPA) is also used to seal the ink on cash receipts and is found in the lining of food cans [102]. And while testing the safety of plastics is hard to do in people, laboratory and animal studies raise serious concerns about the possible effect of plastics on breast cancer risk. Research results show that chemicals from these plastics can act like weak estrogens or disrupt the body's normal balance of hormones [5, 6]. In the 2008-2009 Annual Report of the President's Cancer Panel, they expressed the same concerns: "The Panel was particularly concerned to find that the true burden of environmentally induced cancer has been grossly underestimated. With nearly 80,000 chemicals on the market in the United States, many of which are used by millions of Americans in their daily lives and are unstudied or understudied and largely unregulated, exposure to potential environmental carcinogens is widespread." [6].

"Many pollutants in the environment have biological effects, so even in the absence of specific information linking these chemicals to diseases it is not safe to assume that they are benign. This applies particularly to long exposures (for decades), even at low concentrations, particularly when those exposures are early in life when organs are growing rapidly. Avoidance whenever possible would seem to be a prudent policy."

**Larry Norton, M.D., Deputy Physician-in-Chief for Breast Cancer Programs,
Medical Director, Evelyn H. Lauder Breast Cancer,
Norma S. Sarofim Chair of Clinical Oncology,
Memorial Sloan-Kettering Cancer Center**

New realities of modern life urge us to Think Pink, Live Green

Many risk factors for breast cancer can be reduced. Of course, there are risks that we can't change, such as our past, our family history and genetic makeup, and the fact that we're growing older. But regardless of our past, our bodies have great capacity to forgive, repair, and rebound.

Lifestyle changes we make today could lower our risk tomorrow

While we don't know everything, we know enough to change our lifestyles and make healthy choices. All of us need to take steps to reduce the risk of breast cancer, both for ourselves and for our daughters. Even women and girls with no known family history of breast cancer can lower their risk further by making healthy lifestyle choices. Women who are more prone to breast cancer—because of a strong family history, a known genetic mutation, or a past exposure—need to be extra careful to limit any additional risks.

We've identified 31 steps you can take to *Think Pink, Live Green*. They combine practical information and effective tips on things such as choosing the safest personal care products, buying organic groceries at the market, and using safe cleaning solutions and other household products. Each step is guided by one essential principle—it's better to be safe than sorry.

“You have the power to understand, make, and sustain positive changes in your life and in the lives of others.”

**Gary Hirshberg, Environmentalist, Author,
and President and CE-Yo of Stonyfield Farm**

Each and every day is an opportunity to Think Pink, Live Green...

#1. Think Twice



Challenge the ways you've always done things. Make sure you're taking full advantage of your doctor's recommendations. Consider how your non-medical choices can also enhance your overall health—and your personal risk of breast cancer. Every time you eat, drink, or use products, you have an opportunity to make healthy changes in your life.

#2. Avoid Taking Extra Hormones



It's best to avoid exposing your body to extra hormones, such as estrogen and progesterin, which are contained in medications such as birth control pills and menopausal hormone replacement therapy [37-39]. Consider non-hormonal solutions, such as an intrauterine device (IUD) for contraception, lubrication for vaginal dryness, and meditation and acupuncture for hot flashes. If you feel that you require hormonal medication to improve or

maintain your quality of life, talk to your doctor. You can limit your risk by taking the lowest dose for the shortest time possible

#3. Get To A Healthy Weight And Stick To It



Keeping to a healthy weight is mandatory for breast cancer risk reduction. Ask your doctor what is considered a healthy weight range for your height and body type. A recalculation is necessary during and after pregnancy. If you're within the range, proper diet and exercise can help you maintain it. If you need to lose weight, ask your doctor about safe ways to modify your diet and increase your physical activity level. Cutting calories makes the biggest difference. Girls who stay at a healthy weight and keep physically active are less likely to have early puberty and more likely to maintain these healthy habits as adults [46, 51, 52, 103, 104].

#4. Get Regular Exercise



Exercise is important throughout your life, especially during pregnancy and even as an older woman [105]. Try to get at least 3-4 hours of exercise a week, but 5-7 hours is better. Consider working with a certified trainer. Mix it up in order to keep it fun and help you sustain it over time. Trying new things will help you find physical activities that best fit your style and schedule. Something as simple as walking with a friend is a great way to socialize AND get the benefits of exercise.

#5. Limit Alcohol Use



The risk of breast cancer increases with the amount of alcohol consumed [10, 56-58]. It's best to reduce consumption to 5 or fewer drinks per week. Less is better. All types of alcohol count: wine, beer, and hard liquor. Drinking less also will help you maintain your weight and function at your best.

#6. Stop Smoking



If you smoke, stop. If you are a non-smoker or smoker, limit exposure to second- and third-hand smoke [10, 60, 106, 107]. Avoid people who are smoking and stay away from areas and clothing that smell of smoke.

#7. Get Fresh Air



The outside air is usually much cleaner than the air inside your home, car, or workplace. Carpeting, furniture, and building materials release many unhealthy chemicals [79]. Opening the windows, or using a window fan or air conditioner keeps the air moving and makes the air inside fresher and cleaner. Even better, spend more time outdoors.

#8. Avoid Unnecessary Radiation



Radiation therapy or diagnostic procedures using radiation should be used only if necessary. Pregnant women should not be exposed to any radiation. Radiation exposure should be avoided or limited in teenage girls and young women during the process of breast development. If a diagnostic procedure is ordered, ask if a non-radiation kind of test, such as an ultrasound, can be done instead or as a first step. Always wear a lead body and neck shield during dental x-rays. Mammography in adult women is considered safe [108-111]. Radiation therapy for the treatment of breast cancer in adult women is considered safe and effective. It does not increase the risk of developing another breast cancer.

#9. Get Enough Vitamin D



Ask your doctor to check your vitamin D levels and recommend the right daily dose. The best sources of vitamin D are sun exposure, vitamin D3 supplements, and oily fish [61, 112]. Some dairy products contain or are fortified with vitamin D. Organic sources of fat-free dairy products are your best choice.

#10. Eat Your Fruits And Veggies



Choose fruits, vegetables, whole grains, beans, nuts, and seeds and spices as your main course ingredients for most meals. They are your key source of nutrients with relatively few calories. Choose different colors of produce to obtain the full spectrum of complementary nutrients that your body needs. Fruits, vegetables, and grains also provide important daily fiber that helps you feel more full after eating and keeps your bowels moving.

#11. Select Foods And Beverages Carefully



Many of the pesticides and other synthetic chemicals used in agriculture, food processing, and food packaging end up in your food—and that’s the main way they get into you. Selecting the healthiest products and preparing them carefully can make a big difference. Washing and peeling fruits and vegetables helps reduce the amount of pesticides on the outside, but some pesticides can still remain on the inside. Buying organic foods and beverages can reduce your exposure to these chemicals [5, 82, 113, 114]. Organic products, however, can be expensive. If you can only afford to buy a few, choose organic versions of products that, when grown conventionally, contain the highest levels of pesticides. These are classified as the “Dirty Dozen” by the Environmental Working Group [115].

You can save money by buying regular produce off the “Clean 15” list. These conventionally grown fruits and vegetables are usually grown with

DIRTY DOZEN Buy These Organic		CLEAN 15 Lowest in Pesticides	
WORST	1. Apples	BEST	1. Onions
	2. Celery		2. Sweet Corn
	3. Strawberries		3. Pineapples
	4. Peaches		4. Avocado
	5. Spinach		5. Asparagus
	6. Nectarines (imported)		6. Sweet Peas
	7. Grapes (imported)		7. Mangoes
	8. Sweet Bell Peppers		8. Eggplant
	9. Potatoes		9. Cantaloupe (domestic)
	10. Blueberries (domestic)		10. Kiwi
	11. Lettuce		11. Cabbage
	12. Kale/Collard Greens		12. Watermelon
	13. Sweet Potatoes		
	14. Grapefruit		
	15. Mushrooms		

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relatively low levels of pesticides in conventional farming.

There are other ways to save money. Look for sales and limit your use of ready-made or processed foods. Buy raw ingredients and prepare the food yourself. Soy foods, such as edamame, tofu, and soy milk, are a good and cheap source of protein. But it's best to avoid regular consumption of concentrated soy products, such as soy protein powder, because they may stimulate breast cell activity [116].

Buy poultry, meats, and fish that were raised without antibiotics [5].⁷ To avoid unknown risks of food from animals treated with extra hormones, only buy organic sources of nonfat dairy products and organic or 100% grass-fed beef. It's best to choose small, young fish—preferably wild caught rather than farm-raised [117-119].

Buy whole foods, such as whole grains, because they fill you up more easily and release their energy more slowly during digestion compared to highly processed foods. And limit your consumption of refined sugar and flour because they release their energy quickly, producing blood sugar spikes and hormone elevations that might over-stimulate breast cells.

#12. Know Your Labels



It's important to know that words such as “natural,” “simple,” “pure,” “real,” and “free-range” on food labels don't have official definitions and their use isn't regulated [120]. “No hormones or antibiotics added” doesn't mean they weren't given to the animal before it was butchered. And “Kosher” doesn't affect how animals and crops are grown.

Look for organically grown or produced food with stickers that show the USDA organic symbol or a price look-up (PLU) code beginning with the #9. These products have been produced and processed according to national organic standards as set by the U.S. Department of Agriculture.



#13. Know Your Packaging



Buy your food fresh, frozen, dried (beans, seeds), or in bags or glass jars. Limit your use of canned foods and plastics to avoid exposure to the chemicals that can leach out of the container and into your food [5, 83, 121-125].

Only use plastics with the recycling code #1, 2, 4, and 5, and avoid plastics with recycling codes #3, 6, and 7.



#14. Vary Your Diet And Lifestyle



In food choices, exercise routines, and the products you buy, adding variety and mixing it up can keep you from getting bored and help you sustain healthy habits.

Choose from a variety of food groups to get a broader range of nutrients. Eat fruits and vegetables in a rainbow of colors. When eating meat, follow a one-third meat or fish, two-thirds vegetable ratio to get the most nutrients and to limit animal fat. Try eating different meats—poultry, pork, lamb, beef, goat, or deer. Eat fish at least once a week. It tends to be low in fat and is a good source of omega-3 fatty

acids, which have many positive effects on your body's health [126].

#15. Avoid Empty Calories



Avoid high-calorie foods and drinks that offer little nutritional value. Think of each meal and snack as an opportunity for healthy nourishment. For example, rather than an apple granola bar with few nutrients and lots of added sweeteners, enjoy an apple and a handful of low-fat granola instead.

#16. Eat Small Meals



Eating three large meals a day often provides too many calories at once. This can trigger a series of changes in the environment inside our bodies, which can turn on breast cell growth. Consuming small amounts of food throughout the day limits overstimulation of breast cells and provides other healthy benefits. It's also the best way to meet your body's steady energy requirement and help with weight management. Plus, it means more meals to look forward to.

#17. Cook Real Food



Get your food from the farm, not the factory. When you cook real food from scratch you know much more about each ingredient. Homemade foods usually contain higher-quality ingredients, lower calories, and fewer additives. Processed prepared foods are often full of fat, sugar, salt, fillers, fake ingredients, and preservatives, and are often high in calories. Restaurant food is usually loaded with hidden calories, too [127]. You can save money and keep your weight down by cooking at home. When you do eat out, plan ahead. Eat something light and healthy before going out in order to avoid overeating once you get there. When ordering, stick to small portion sizes or two appetizers rather than an appetizer and entrée. Cooking real food at home is also an opportunity to promote and sustain a family habit of eating healthy and having family meals. If we set the example, our girls are more likely to eat well throughout their lifetimes [128].

#18. Choose Healthy Cooking Methods



There are many ways to prepare food that maintains or enhances its nutrients, including sautéing, stir-frying, roasting, baking, poaching, and steaming. You can microwave your food, but not in plastic! [83]. Broiling and grilling also are healthy methods, as long as food is not blackened. Avoid deep-frying [129].

#19. Use Safe Cookware, Storage Containers, Serving Items



When cooking, storing, freezing, reheating, and serving food, it's best to use stainless steel, ceramic, cast iron, glass, and enamel-covered metal containers, pots, and dishes. Do not use non-stick pots and pans at very high heat, because they can release harmful chemicals [130]. Avoid cooking or heating food up in plastic, even if the container claims to be

“microwave safe.” [83].

#20. Drink Filtered Tap Water



The public water supply in most major U.S. cities is usually very safe to drink straight from the tap. But public water supplies in some areas may be polluted by nearby large scale agricultural or industrial operations. Regular testing of public water quality is reported by the “Consumer Confidence Report” (available by web: <http://water.epa.gov/drink/info/ccr/basicinformation.cfm>). Those using private well water can have it tested by state-certified private companies. Bottled water is usually just tap water that may or may not have been filtered. Its safety and source are often unclear [131]. Unless you have a specific reason to buy bottled water, stick to tap water.

Filter your tap water if its quality is unknown or unsafe. You can use a commercially available filter pitcher or a filter on your faucet or under the sink. Some people invest in a whole-house water filter system. Look for filters bearing NSF Standard 53 certification. These types of filters can remove many (but not all) kinds of contaminants. All water filters need to be changed on a regular basis.

#21. Choose Safe Personal Care Products



It is best to buy products that are made without fragrances, hormones, and preservatives. You can also find new solutions that don’t involve heavy use of commercial products. For example, rather than reapplying lots of sunscreen throughout the day, use sun-protective clothing and a wide-brim hat and avoid the most intense sun exposure between 10 a.m. and 2 p.m. <http://www.ewg.org/2010sunscreen/> Instead of a moisturizer with a ton of ingredients you can’t pronounce, choose cocoa butter or an oil that’s good enough to eat, such as olive or coconut oil. For information on safer product options, visit <http://www.safecosmetics.org> and http://www.ewg.org/files/EWG_cosmeticsguide.pdf.

#22. Use “Green” Household Products



Consider organic or “green” household supplies that tend to be safer for you and the environment. For detailed information on non-toxic, environmentally friendly products, visit <http://www.goodguide.com>. The U.S. Department of Health and Human Services also offers a searchable database on household products at <http://householdproducts.nlm.nih.gov/>.

#23. Manage Your Emotional Stress



Emotional strain can ruin your quality of life and may even affect your breast health [132, 133]. Fear of breast cancer, depression, and anxiety can drain all your energy and steal the joy of living. Critically judging yourself and others and holding onto unrealistic expectations adds to your emotional burden. Anything you can do to reduce your stress and enhance your emotional comfort and joy will help your body recover better from the wear and tear of modern life. Focus on the present rather than worry about the past and future. Adjust your expectations to make them reasonable. Don’t take on too much at once.

Break down tasks into doable chunks. Try to see a disappointment as a valuable life lesson rather than a terrible mistake or a dismal failure. Mindful measures such as meditation, yoga, visualization exercises, and prayer can be valuable additions to your daily or weekly routine. These practices can reduce your emotional stress and build your energy, confidence, and determination to take care of yourself.

“Mindfulness is never about doing something perfectly—it is about allowing things to be as they are, resting in awareness, and then, taking appropriate action when called for.”

Jon Kabat-Zinn, Ph.D., Professor of Medicine Emeritus, UMass Medical School, Founder, Mindfulness-Based Stress Reduction

#24. Manage Your Physical Strain



You can only feel your best when your whole body is functioning well. It's important to address any active medical problem, such as metabolic conditions and persistent low-grade infections. For example, when blood sugars are out of control for extended periods of time, the risk of breast cancer may increase [134]. Your doctor can help you keep diabetes in check with nutritional counseling, changes in diet, and if necessary, with medication, and recommendations for support groups.

Taking good care of yourself on a daily basis is also a key to keeping you healthy and feeling your best. Exercise boosts your overall health including your breast health. Your kidneys and bowels will run regularly and smoothly if you are well-hydrated and consume a high-fiber diet. Drink mostly water rather than sodas or juices. Aim for at least 25 gm of fiber a day through foods and supplements [135, 136]. Strengthen your bones with calcium as well as vitamin D. Many doctors recommend 1200 mg of calcium/day in divided doses and 600-2000 IU vitamin D3/day (depending on your unique situation) [137-139]. Your immune system will function much better when areas of inflammation and active sores are treated. For example, something as simple as brushing and flossing your teeth helps prevent inflammation of your gums and other tissues in your mouth [140].

#25. Sleep Well



Your cells experience many insults and injuries throughout the day from the normal wear and tear of living. The good news is, your body has great capacity to heal the damage, keep your cells growing normally, and make you feel good. Repair is a continuous process, but much of the healing and internal housekeeping occurs at night. So it's important to get enough sleep by limiting caffeine use, keeping your bedroom quiet and dark, minimizing daytime naps, managing snoring and hot flashes, and avoiding other interruptions [69].

#26. Consider Earlier Pregnancy



It can take a lot to have a baby—a partner, time, energy, security, and resources, as well as the ability to get pregnant in the first place. When and if your circumstances are aligned with this goal, consider starting your family sooner rather than later. Scientific research and population studies tracking the impact of pregnancy and breastfeeding on the risk of breast cancer strongly suggest that earlier pregnancy and longer duration of

breastfeeding can help lower the risk of breast cancer [41].

#27. Know Your Personal And Family History



It's critically important to know your personal and family history of cancer as well as other risk factors. You may be at high risk for breast cancer if you have a strong family history of breast and related cancers, an inherited breast cancer gene abnormality, a prior history of breast cancer, a prior breast biopsy that showed early abnormal breast changes, or if you received radiation therapy for acne or Hodgkin's disease as a girl or young woman.

Get information about any type of cancer in your blood relatives from both your mother and father's sides of the family. Also, find out each relative's age at the time of cancer diagnosis. Be sure to share this information with your doctor and update your file if any new cancer diagnoses are made. If you have had a breast biopsy, get a copy of your pathology report and discuss it with your doctor. Certain types of non-cancerous breast changes may increase your risk of breast cancer in the future.

#28. Take Extra Steps To Reduce High Risk



Women and girls at high risk for breast cancer should take extra steps to help reduce their risk of being diagnosed with breast cancer or experiencing a breast cancer recurrence [10, 16]. Genetic counseling, genetic testing, risk-reducing medications, and preventive (prophylactic) surgery are all options to discuss with your physician.

#29. Vote At The Cash Register And The Polls



Public awareness about the environment has played a critical role in creating better policies and procedures to protect people and the planet. Growing consumer demand has made so many more healthy options available. Vote at the cash register by choosing healthy products and vote at the polls for laws that require environmentally responsible methods of farming, manufacturing, energy production, food preparation, water treatment, and new product development. Everything is at stake.

#30. Start Now And Try Your Best



Change is a journey. You have to start somewhere. Whether it's making the choice to avoid plastics or rethinking your food choices, roll up your sleeves and get busy. Some changes may be easy to make. Some may feel out of reach. You can only do the best you can—and you should feel good about your efforts. Whatever first step you take is one in the right direction. One step leads to two steps and then more. For more information and guidance about how to *Think Pink, Live Green*, go to <http://www.breastcancer.org>.

#31. Believe In Yourself. Lead By Example



To one day live in a world without breast cancer, it's going to take a movement. You have the power to make and sustain a life-saving difference—for yourself, your children, and many others. Your knowledge will help you make the healthiest choices possible. We all want to see an

end to breast cancer. Spread the word and practice what matters most. Others will follow your lead.

“If everyone does one thing, they are likely to do two things, then three things. Then they are likely to influence friends and family, and that’s how you build a movement.”

**Laurie David, Environmentalist, Author,
and Producer**

“Be the change you wish to see in the world.”
Gandhi



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The scientific basis of *Think Pink, Live Green* has been developed in close collaboration with **Joan Ruderman, Ph.D.**, who is the Marion V. Nelson Professor of Cell Biology at Harvard Medical School, a member of the U.S. National Academy of Sciences, and a 2010-2011 Fellow at the Radcliffe Institute for Advanced Study. Her research group studies the mechanisms that regulate cell growth and hormonally active pollutants that can act like estrogen.



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Lankenau Medical Center and Dr. Robert and Elissa Robinson Segal and family are proud to work with Breastcancer.org to provide *Think Pink, Live Green*. Working together, we can make an even bigger difference to help families protect their breast health and reduce their risk of breast cancer.

A fully referenced version of this booklet is available on Breastcancer.org and on each partner's website.

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