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# Together: Every woman's guide to preventing breast cancer

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# TOGETHER

## Every Woman's Guide to Preventing Breast Cancer

*for Mothers, Daughters, and Women of All Ages*

A Washington University School of Medicine eBook

Graham Colditz, MD, DrPH  
Katherine Weilbaecher, MD  
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## What You'll Discover In *Together*

***That...***

*...breast cancer is [a unique disease](#) that deserves all the attention it gets.*

*...over [half](#) of all breast cancers [can be prevented](#).*

*...you can lower your risk with many healthy behaviors you already know about – and some you don't.*

*...some things you think cause breast cancer likely don't.*

*...simple tips [can help your daughters and granddaughters](#) improve their breast health and lower their adult breast cancer risk.*

*...women at high risk of breast cancer can take important steps to lower their risk and protect their health.*

*...it's important for all of us to work together to improve the [health of our families and our communities](#).*

*...a few key rules can help you [make sense of confusing health news](#).*

*...simple recommendations can help you lead [a healthy life as a cancer survivor](#).*

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## Introduction

For better or worse, breast cancer is a disease in the spotlight. There really is no other modern health condition that garners the same emotional and philanthropic response of the public at large. It is a disease that inspires and a disease that sparks fear.

And it certainly deserves the attention it gets.

While there are serious diseases that affect more women– heart disease and diabetes, for example – none has the same overall impact of breast cancer. As well as attacking a part of the body viewed by many women - and much of society - as an integral part of femininity, breast cancer is the leading killer of women in mid-life. About a fifth of all cases develop before the age of 50, a time in life when many women have young families and are reaching the peak of their careers.

The toll of these two characteristics alone is huge. Add to them the fact that nearly three million women in the United States have been diagnosed and treated for breast cancer and currently live as survivors, and the reach of the disease becomes hard to fathom. This is even more so globally, where breast cancer is the leading cancer in women, with 1.7 million new cases in 2012 alone. One in four cases – or 25 percent – of cancer in women across the world is breast cancer.

However, there has also been great progress over the past 25 years in tackling the burden of breast cancer. With advances in early detection and treatment, women with breast cancer are today living longer than ever before. And the treatments themselves have become more targeted and less traumatic – significantly improving the quality of lives of many patients.

It's undeniable that such advances have had real and important benefits for generations of women. Still, the reality is that breast cancer is not a problem we can treat our way out of – at least not in the foreseeable future. The disease is simply too prevalent, too complex, and too diverse. So, while the quest for a cure is as important as it is alluring, it is equally crucial that we focus on something often viewed as more mundane: Prevention.

Yet, prevention's potential impact is so great that you may have trouble believing it at first. At least **half** of all breast cancers could be prevented by things most women can do, and this number is likely even higher the earlier in life healthy behaviors take hold (see figure).

## Percent of Breast Cancer Potentially Avoidable if Prevention Begins at Age 2 Years

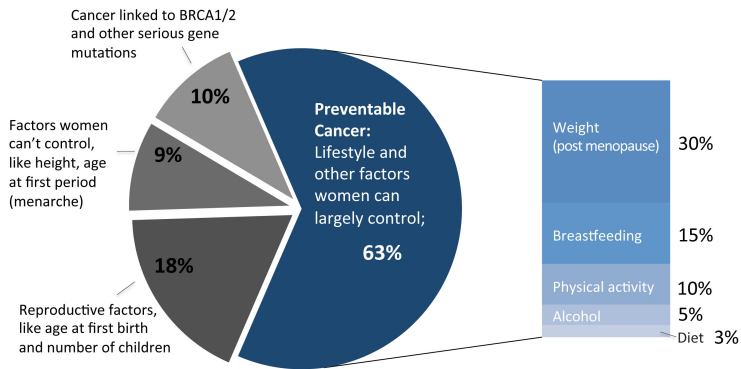


Figure – Half of breast cancers are preventable with healthy lifestyle choices, and the percentage is even higher when healthy choices take hold early in life. It's almost never too early to begin to form healthy habits. Derived from Table 1, Colditz and Bohlke, 2014.

To best understand how to prevent breast cancer, though, it's important to first understand what's driving current rates of the disease – rates which far surpass those from just 50 years ago.

What's caused this dramatic rise in breast cancer? It's due to a complex interplay of increased blood hormone levels, changes in reproductive patterns, and unhealthy behaviors that go hand-in-hand with our modern lifestyles. We'll discuss each of these in detail later, but together they show that breast cancer risk is an issue that is as much a societal issue as it is a personal one.

Further illustrating this point are new findings showing that early life is a key period in determining later adult breast cancer risk. Breast tissue seems most vulnerable to harmful changes and exposures in the years between childhood and when a woman has her first child. Laying the foundation for healthy lifestyles as early as possible – within families, communities, and schools – can help sustain these behaviors throughout life and also promote breast health at a critical time in girls’ development.

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### **Parents & Grandparents**

*It’s almost never too early to help children begin to form healthy habits. Early life is a key period in determining later adult breast cancer risk.*

See: Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life

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Unfortunately, trustworthy and accurate information about ways to prevent breast cancer can be hard for women to come by. The Internet is as much a Wild West of information as it ever has been. It’s a place where bad science can look like good science, good science can look like bad, and it’s all awash in pink ribbons.

Gathering decades of research, *Together* gives women the knowledge and tools they need to be proactive when it comes to breast health and breast cancer. In it, they’ll learn: what makes

up their risk of the disease, what they can do to lower their risk, and what steps they can take to help protect their daughters and granddaughters from the disease.

Every woman has the power to improve her breast health. And every woman has the power to help others in their lives make healthy choices that lower their breast cancer risk. Some steps are easy. Some are harder. But they're all important. This book is your guide.

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**Did You Know?**

*At least half of all breast cancers could be prevented by things most women can do.*

See: Simple Steps for Preventing Breast Cancer

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## What is Breast Cancer?

Although breast cancer is often referred to as a single disease, it's actually a collection of many different types of diseases, with one thing in common – breast tissue that is growing out of control. Cancer most often starts in one of two places in the breast: the lobes, which are the milk-producing glands, and the ducts, which are the tubes that carry the milk from the lobes to the nipples for breastfeeding (see figure).

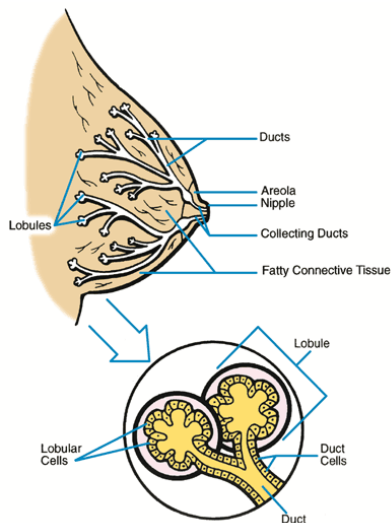


Figure - Anatomy of the breast

When the out-of-control cancerous cells have broken outside of the ducts and lobes and spread to other tissue in the breast or beyond, this is called “invasive” breast cancer. Invasive cancer is the type that most people are referring to when they talk about breast cancer.

There are many sub-types and stages of invasive cancer. One of the most important determinations is how far the cancer has spread – if at all. The more “localized” a cancer tumor is – the more it has stayed in the place it began – the less serious it is, and the more likely it is to be treatable. A tumor with cells that have spread to the lymph nodes near the breast or armpits is more serious than one that has not. And a tumor whose cells have traveled to another organ, such as the lungs or brain, is more serious than one that has travelled to the lymph nodes but not beyond.

Today, most breast cancers are found in the early, localized stage. Close to 99 percent of women with these early-stage cancers live at least five years after being diagnosed <sup>1</sup>.



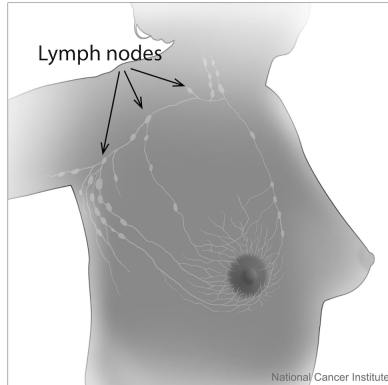


Figure - Lymph nodes are small clusters of tissue that contain white blood cells and filter lymph fluid. They are often the first place that cancer will spread to from the breast (Image: NCI/Don Bliss).

### **Carcinoma In-Situ (DCIS & LCIS)**

In addition to invasive breast cancer, there is also a type of breast disease that falls into a cancer gray area of sorts, called carcinoma in-situ. Carcinoma in-situ has some of the same characteristics of invasive cancer, but the abnormal cells involved stay contained within the ducts and lobules of the breast, rather than breaking through into the breast tissue itself as with invasive cancer.

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#### **Did You Know?**

*No matter your family history or medical history, healthy behaviors can likely lower the risk of breast cancer and improve overall health.*

See: Simple Steps for Preventing Breast Cancer

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There are two main types of carcinoma in-situ: ductal carcinoma in-situ (DCIS) and lobular carcinoma in-situ (LCIS). Both types increase the risk of developing invasive cancer by 4 - 10 times, with DCIS generally the more serious of the two.

LCIS ([more](#)) is marked by abnormal cells confined to the lining of the lobules of the breast. These cells don't turn into cancer themselves, but they are a risk factor for invasive cancer. This means a woman who has LCIS is more likely than average to develop invasive breast cancer.

DCIS is marked by abnormal cells confined to the lining of the breast ducts, and unlike LCIS, DCIS growths can develop into invasive cancer. Because of this – and other characteristics - it is considered a very early form of breast cancer, often referred to as “stage 0.”

In the past, DCIS was a disease that often went undetected. But with increases in the percentage of women being screened for breast cancer – and with improvements in screening technology – today it is found much more often. By some estimates, up to 30 percent of all breast cancers found by mammogram are DCIS.

Because most of the factors that influence the risk of invasive breast cancer also influence the risk of carcinoma in-situ, the discussions of cancer risk ([more](#)) and prevention ([more](#)) that follow largely apply to both.

## **Why is Breast Cancer So Important?**

There is a great deal of hype around breast cancer. From nationwide charity runs to pink-colored cereal boxes to daily media coverage of new research studies, breast cancer reaches into nearly every sector of the medical and consumer market. And while it could be argued that this has a down side – inflating women’s fears of breast cancer in relation to other important life risks (like heart attacks or car crashes) – there is a real basis for breast cancer being such a prime focus of the health and medical communities.

Over the next year in the United States, over 230,000 women will be newly diagnosed with breast cancer and close to 40,000 women will die of the disease. While early diagnosis and improved treatment means that women diagnosed today will have an 89 percent chance overall of living at least five more years, this also means that the number of women living as breast cancer survivors has grown to three million in the US alone. The stories of cancer survival are to be celebrated, yet also make it impossible to ignore that huge numbers of women have had to endure the emotional and physical toll of not only diagnosis and treatment but also the journey of life as survivors.

One of the tragic characteristics of breast cancer is not simply how common it is but that it is also a leading killer of women in mid-life. About a fifth of all breast cancers are diagnosed in women younger than 50 years old (see figure) and around five

percent is diagnosed in those younger than 40. Of all the cancers diagnosed in women by age 40, 40 percent are breast cancers <sup>2</sup>, and the average woman with breast cancer loses nearly 16 years of life to the disease <sup>3</sup>.

How starkly different a profile this is from that of many other chronic diseases becomes clear when you look at heart disease. The average age of a first heart attack in women is 70 years old, whereas, the average age at a breast cancer diagnosis is nearly 10 years younger, at 61 <sup>1,4,5</sup>.

Though most women diagnosed with breast cancer are over 50, the relatively large percentage of younger women diagnosed with the disease can have broad-reaching implications. At a period in life when women have young families – or want to start families – and are reaching the pinnacle of their careers, many women are forced to deal with the emotional, psychological, financial, and physical challenges of breast cancer. And these challenges are not simply personal; they also involve concerns for family and other loved ones who may rely on them for support of all kinds.

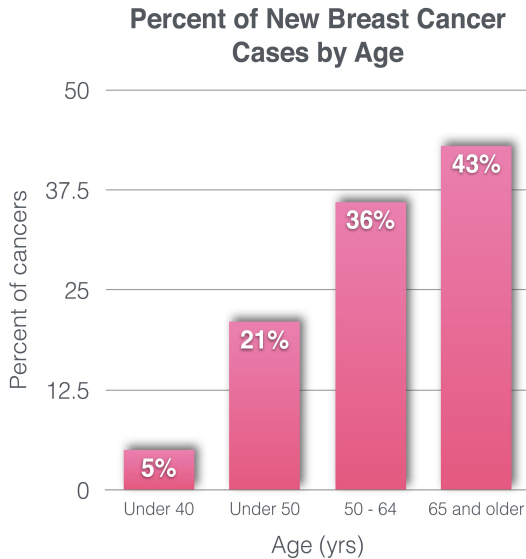


Figure - Breast cancer becomes more common with age. Data source: American Cancer Society, Surveillance and Health Services Research, 2013

### **A Health Divide – Breast Cancer Disparities**

It may not be too surprising to hear, but not all groups of women are affected by breast cancer equally, and the real-life implications of this can be enormous. Race, ethnicity, income, and education level can each have an important impact on rates of developing as well as dying of breast cancer ([more](#)). In the United States, white women tend to have the highest rates of the disease, but black women are more likely to die from it. Women with low income and little education are also more likely to die from breast

cancer compared to women with more education and greater income ([more](#)). Why this is, exactly, isn't perfectly clear.

The inter-linked issues of race, income, and education likely play a key role in limiting access to proper health care. This can cause delays in diagnosing cancer as well as treating it, both of which can shorten survival. Biology, though, also seems to be important. The cancers that many black women get are simply different from those that white women get. They can be more aggressive, and they can develop earlier in life. These cancers are harder to treat and are, therefore, more deadly.

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### **Did You Know?**

*In the United States, white women tend to have the highest rates of breast cancer, but black women are more likely to die from it. Women with lower incomes and less education are also more likely to die from breast cancer compared to women with greater incomes and more education. Important efforts aim to narrow these gaps.*

See: Race and ethnicity

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Addressing such disparities in breast cancer care – and cancer care in general – has become a top priority in health circles. Yet,

because the problem envelops so many different areas – biology, race, income, and health care, to name just four - it will unfortunately not be a quick fix. The fact that this major problem is gaining recognition and resources raises hope that we'll soon make positive strides in closing this divide.

## **Going Global**

In many ways, breast cancer looks even more ominous on the world stage than it does in the United States. It has the dubious distinction of being the most common cancer in women worldwide, and no surprise, is also the leading cancer killer of women worldwide <sup>6</sup>. Around one out of every four cancers diagnosed in women across the globe is breast cancer, and there are 1.7 million new cases each year.

While high-income countries tend have much higher rates of the disease than middle and low-income countries, things are changing quickly with globalization. As lower-income areas quickly adopt more Western lifestyles, rates of breast cancer are increasing – often quite quickly. This is especially so in Asia, where rates of breast cancer have doubled over the past decade, with risk of the disease in premenopausal women approaching that in the United States ([more](#)).

## **The Good News**

As serious as breast cancer is, and as big of an impact as it has in the United States and the world over, its story is not all doom and gloom. There have been great advances in treatment that have not only helped extend life but also made the process of treatment less traumatic. Just as importantly, we've honed the science of breast cancer prevention – both for the average woman and for the woman at high risk ([more](#)). The latest evidence shows that at least half of breast cancers could be avoided by things most women can do right now.

We'll talk about these next.



## **What is Risk? What is Prevention?**

The word “risk” gets thrown around a lot these days. And that’s actually a positive thing, particularly when it comes to breast cancer. By knowing your risk of breast cancer, and what factors make up that risk, you can make better-informed decisions about not only your breast health but also how you choose to mentally and emotionally deal with the issues of breast health and breast cancer.

There are many different ways to describe breast cancer risk. Two that are often used are “lifetime risk” and “10-year risk.” Lifetime risk is the chance that an average woman will develop breast cancer anytime during her life. And 10-year risk – as the name implies – is the chance that an average woman will develop breast cancer over a 10-year period – say, from age 50 to age 60.

The ratio “1-in-8” – which many women will recognize – is simply one way to describe lifetime risk. It means that out of every eight women born in the United States, one will be diagnosed with the disease during her life. Described another way, “1-in-8” translates to about a 12 percent average lifetime risk.

Compared to the lifetime risks of many other diseases, 12 percent is pretty high but certainly not the highest. The lifetime risk of heart disease, for example, is about 50 percent.

Not surprisingly, looking at breast cancer risk in shorter 10-year segments can make things look less daunting. Because diseases like cancer and heart disease are more common as women age – and to be blunt, because everyone eventually dies of something – lifetime risks can easily inflate the perception that a disease is more threatening than it actually is. This is because, for the average woman, so much of the risk accumulates later in life.

For some perspective, let's look at the risks of breast cancer across some shorter 10-year age groups: the average woman's risk of developing breast cancer from age 40 to age 50 is 1.5 percent; from age 50 to 60 is 2.3 percent; and from age 60 to 70 is 3.5 percent <sup>7</sup>.

This means that out of one hundred 40-year-old women, 1.5 would develop breast cancer by the time they turned 50; out of one hundred 50-year-old women, 2.3 would develop breast cancer by the time they turned 60; and out of one hundred 60-year-old women, 3.5 would develop breast cancer by the time they turned 70. (Of course, these are statistical “people” since you can't have part of a person).

While a lot lower than the 12 percent “1-in-8” lifetime risk, these 10-year risks still show that breast cancer is a prominent disease – with risks many times higher than those of colon cancer for the same age groups. Yet, they also show that breast cancer is not as

imminent a threat as many women fear. It's not uncommon for younger women to overestimate their risk of dying from the disease over the next 10 years by up to 20 times <sup>8</sup>.

Many factors determine a woman's risk of breast cancer, including things she has control over, like exercise and diet, and things she has little or no control over, like age and family history. Focusing efforts on those factors that can be changed for the better can help lower the risk of breast cancer.

In other words, it can help prevent it.

### **An Ounce (or More) of Prevention**

Prevention has become a real buzzword of late, and that makes many a health professional jump for joy. Why? Well, let's look at the classic "river story" parable, which we'll paraphrase.

*A woman was walking on a riverbank and saw someone floating down the river yelling for help. The woman picked up a large tree branch and fished the person out. No sooner did she do that than another person came floating down. She fished that person out. Then another and another and another came down. She asked others to help rescue the people. And they did. Still, more and more came floating down, and the rescuers were soon overwhelmed, realizing they couldn't help everyone.*

*The woman decided to quickly run up-river to see why so many people were falling in. On a popular bridge over the river, she found a large, obscured hole that people were falling through. She patched it, and people no longer fell into the river through the hole.*

This story perfectly illustrates the power of prevention. By working to stop problems early on (patching the hole), you can help avoid bigger, harder issues later (people falling in and floating downstream). We'll never be able to stop all the people from falling into the river. But by repairing as many holes in as many bridges as possible, we can help reduce the number of people who fall in and need heroic rescue downstream.

It's the same way with diseases like cancer and heart disease. We can lower our risk of having a heart attack or getting breast cancer by making healthy choices, like eating good food and staying fit. And as a society, we can help foster such healthy choices by doing things like building more bike paths, getting healthier menus in schools, and making sure physical education is an integrated part of every school's curricula.

Of course, prevention isn't perfect. We'll likely never be able to stop 100 percent of cancers or heart attacks. But healthy choices can greatly reduce risk, helping some people avoid such diseases altogether or delay them until much later in life – extending years of quality living.

Mundane as it can seem, prevention truly is one of our most powerful health tools and offers the most realistic, efficient, and effective way of tackling the growing burden of chronic diseases the world over.

---

**Did You Know?**

*Screening tests can help find breast cancer early when it's most treatable. The American Cancer Society recommends that most women begin annual mammograms at age 40. Women at high risk of breast cancer may have enhanced screening that begins earlier or uses different tests.*

See: Finding Cancer Early

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## **Past, Present, and Future - The Things That Make Up Breast Cancer Risk**

Now that we've talked generally about risk and prevention, it's time to get a little personal and review the range of factors that might make up *your* risk of breast cancer – and the risk of those close to you.

We'll discuss a pretty broad list that may include some things that surprise you (“night shift work, really?”) and may *not* include some things you thought for sure would be here (“where are pesticides?”).

## **Hormones and Breast Cancer**

One aspect that ties a number of these risk factors together is their effect on a woman's blood level of certain sex hormones, particularly estrogen. Estrogen is often a key initiator of the process that transforms normal breast cells into cancerous cells. It can also be an important promoter of cancer, fostering the reproduction and growth of cancer cells into larger tumors.

---

### **Parents & Grandparents**

*The hormone estrogen is often a key initiator of the process that transforms normal breast cells into cancerous cells. Healthy behaviors started in childhood may help cut down on lifetime levels of estrogen, possibly lowering later adult breast cancer risk*

See: Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life

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One report that looked at the results of many studies found that women with the highest levels of estrogen in their blood had 2 – 3

times the risk of breast cancer compared to those with the lowest levels <sup>9</sup>. The large Nurses' Health Study found this risk even higher: a nearly four times increase comparing women with the highest levels of estrogen compared to those with the lowest levels <sup>10</sup>. To put this into perspective: This is a degree of increased risk on par with high cholesterol levels and heart disease or smoking a pack of cigarettes a day and chronic bronchitis.

Looking across a woman's life, the majority of her estrogen exposure occurs during the reproductive years – between the time periods begin (menarche) and the time periods stop (menopause). These are the years the ovaries are functioning normally and producing regular amounts of estrogen.

During this time, the ovaries also produce other hormones, most notably progesterone. And the interplay between estrogen and progesterone during the menstrual cycle can also contribute to breast cancer risk. During the first half of the menstrual cycle, estrogen is released, and during the second half, estrogen levels drop and progesterone levels increase. This wave of exposure between estrogen and progesterone during each menstrual cycle stimulates breast cells to divide. Though this cell division isn't something a woman notices, it's rapid enough and repeated enough throughout life that it can introduce small errors in the DNA of breast cells that over time can increase cancer risk <sup>11,12</sup>.

After menopause, when the ovaries stop producing hormones, progesterone levels in the blood drop to nearly zero. Estrogen levels in the blood drop dramatically as well, but not to zero, because fat tissue (even in lean women) still produces some estrogen by converting precursor compounds into the hormone. The more fat a woman carries after menopause, the more estrogen her fat cells will produce, and the higher her blood estrogen levels will be.

This natural rise-and-fall pattern of hormone production across the lifespan is uniquely reflected in the rates of breast cancer at different ages. For most cancers, like colon cancer, the rate of new cases increases steadily as people age. With breast cancer, it's a bit different. Rates of the disease kick up dramatically in the reproductive years around ages 20 to 40 years old, then start to slow down and eventually level off after menopause (see figure).



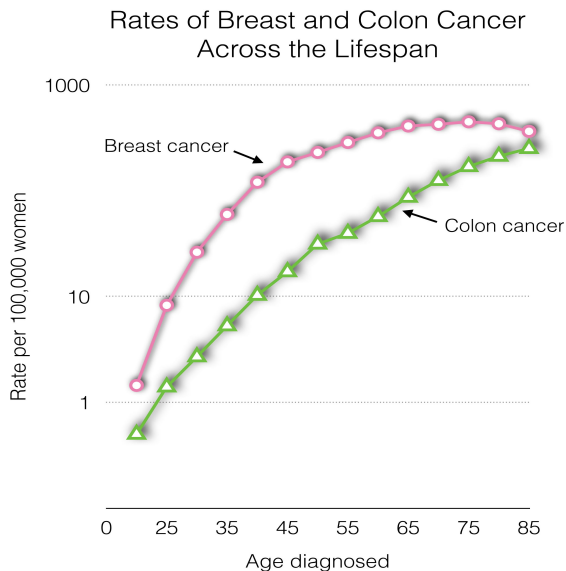


Figure – Colon cancer rates increase steadily with age while breast cancer rates rise in the mid-20s up to menopause, then level off. Data source: NCI/SEER 1975-2011.

A lot of different factors determine the amount of estrogen a woman is exposed to in her life. Starting menstrual periods at a young age and going through menopause late can greatly increase lifetime estrogen exposure simply because the ovaries have a longer time to produce the hormone. A woman who started her period at 11 and went through menopause at 55 will have produced much more estrogen over her life than a woman who started her period at 15 and went through menopause at 50.

Of course, many other factors can have a significant impact on exposure to estrogen, and they range from drinking alcohol ([more](#)) and taking postmenopausal hormones ([more](#)) to breastfeeding ([more](#)), being physically active ([more](#)), and being overweight after menopause ([more](#)) - each of which we'll discuss later.

### **Some Things We Can't Change**

For any disease, there are risk factors out of our control that have an important bearing on the risk of getting that disease. For some conditions – say, a genetic disease like sickle cell anemia – risk is made up of factors out of our control. For other diseases – say, heart disease and type 2 diabetes – risk is largely made up of factors that we can control.

Breast cancer falls somewhere in the middle of these two extremes. Factors that are out of a woman's control play an important role in the overall risk of the disease, but they certainly don't tell the whole story.

Understanding how these uncontrollable factors affect risk, though, allows you to better understand your overall risk of breast cancer and to plan the steps you can actually take to lower or manage that risk.

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**Did You Know?**

*Factors that are out of a woman's control – like age and family history – can play an important role in the risk of breast cancer, but they don't tell the whole story. Women can take important steps to lower or manage their risk.*

See: Some Things We Can Change

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**Age**

The single most important risk factor for breast cancer is age. For nearly all chronic diseases – from cancer to heart disease to arthritis – the older you are, the greater your risk. Breast cancer is rare in women under 30, becomes more common between 40 and 50, and reaches its peak between 55 and 65. The average age breast cancer is diagnosed is 61.

Around 20 percent of breast cancers develop before menopause, with 80 percent developing after menopause.

**Family history and genetics**

Of all the factors linked to breast cancer, family history is the one most people are likely to put at the top of the list. Yet, while there's no denying the importance of family history, for most women it's not as key a factor as they might think.

Having a mother or sister with breast cancer (who are called first-degree relatives) increases the risk of the disease by about 50 percent. If both your mother and sister had breast cancer, or developed it at an early age, it can double or triple risk. While these numbers are nothing to dismiss, they're not much higher than those of other risk factors for the disease – like obesity ([more](#)) or postmenopausal hormone use ([more](#)).

Of course, there are exceptions. For some women who do have a special genetic or family history, risk of breast cancer can be greatly increased. The most well known example of this is women who have mutations in the *BRCA1* or *2* genes. These mutations impart an approximately 45 – 65 percent lifetime risk of developing breast cancer. This compares to the 12 percent lifetime risk of the average woman in the United States.

The increased risk linked to *BRCA1/2* mutations is striking but doesn't mean that every woman with a *BRCA1/2* mutation will develop breast cancer. Looking at the numbers from the opposite standpoint, 35 – 55 percent of women with these mutations will *not* go on to develop the disease.

Thankfully, *BRCA1/2* mutations are rare. Around one in 300-400 women in the United States has a *BRCA1/2* mutation, which translates to just around a quarter of one percent (0.25 percent) of American women.

Other less well known genetic conditions can also greatly increase the risk of breast cancer, such as mutations in the genes *TP53*, *PALB2*, *CDH1*, *ATM*, *CHEK2*, *PTEN*, and others. Outside of known mutations, a significant family history can also signal an important genetic susceptibility to breast cancer. Hereditary Breast and Ovarian Cancer Syndrome is marked most frequently by having multiple family members with cancer, especially at younger ages; a single family member who has had multiple different cancers; and breast cancer in male family members.

For women who have these very high-risk conditions, it's important to seek advice from a genetic counselor and to talk with a breast cancer specialist about options to manage the risk of the disease. The most common approaches for women with a high-risk mutation or strong family history include: watchful waiting with frequent screening tests that can help find any cancer that does develop in early stages; taking prescription risk-reducing medication ([more](#))<sup>13</sup>; or having preventive surgery that removes the breasts (bilateral prophylactic mastectomy) and maybe also the ovaries (bilateral oophorectomy), which can further lower risk.

Despite some high profile stories in the news touting one option over another, each of these approaches has its merits. Genetic counselors and a woman's breast health specialist can help her work through all the choices and help her decide which may be the best for her.

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**Did You Know?**

*Women at high risk of breast cancer can take active steps to manage their risk. Depending on the situation, options can include taking risk-reducing medications, getting enhanced screening, and having preventive surgery.*

See: Options for Women at High Risk

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**Race and ethnicity**

As with most other major chronic diseases, breast cancer doesn't affect all groups of women in the same way.

In the United States, white women tend to have the highest rates of the disease, followed by black women, Hispanics, and Asians and Pacific Islanders. American Indians and Alaska Natives tend to have the lowest rates. It can be hard to peg exactly why these differences exist. But it seems that much of it may have to do with reproductive patterns (like, the age that women tend to start families) and other risk factors (like, weight gain and obesity). These can have important effects on the lifetime exposure to estrogen as well as the sensitivity of breast tissue to certain breast cancer risk factors.

Women of French, German, and Eastern European Jewish heritage – Ashkenazi Jews – are also at increased risk of breast cancer compared to other women, largely due to a much higher than average rate of *BRCA1/2* mutations ([more](#)).

When it comes to rates of dying from breast cancer, black women move to the top of the list. And, again, it's not perfectly known why this is. Black women are more likely to develop aggressive, harder to treat types of breast cancer, so this likely plays an important role. But there's good evidence that other factors are also key, such as varying access to health care and related factors.

Developing effective approaches to address – and eventually eliminate – such health disparities is a key goal of the medical and public health fields.

### **Income and education**

This doesn't fit perfectly into this “things we can't change” section since there is often the opportunity to move into a different income level and to get more education. But, unfortunately, as the economy changes and funding for social services and education get squeezed, such mobility is becoming harder and harder in the United States. The income and education group a person is born into has a distinct link to where he or she winds up. And, like race and ethnicity, this has important implications for breast cancer. Studies show that income and education level – and even overall education level of the community in which a woman lives – have

an impact on breast cancer survival. Women with low income and little education are about 40 percent more likely to die from breast cancer compared to women with more education and greater incomes <sup>14</sup>.

## **Height**

While weight gets a lot of media attention, its close relative, height, gets relatively little, but there's a lot of good evidence that height plays an important role in the risk of certain cancers – breast cancer included. Women who are tall – generally considered 5' 8" or taller – have about a 30 – 50 percent greater risk of breast cancer than women who are shorter.

Why would this be? It likely has to do with the rapid growth that most tall women go through in childhood and pre-adolescence. When that smallish girl sprouts quickly into a tall high schooler or young adult, the cells in the body have a lot of duplicating to do. And with this rapid duplication, there's opportunity for some small errors to get introduced into the DNA of cells. These small errors, given the right mix of other factors, can increase the risk of breast cancer later in life.

And studies suggest that healthier diets – higher in plant foods and lower in animal protein – may help moderate how quickly girls grow without affecting how tall they ultimately become <sup>15</sup>. Though the end height is the same, it's possible that reaching that



height at a slower rate may help lower breast cancer risk later in life.

### **Breast density**

Breast density is another risk factor that tends to fly under the radar of most people. Yet, like height, it can have an important impact on the risk of the disease.

What is breast density? It's essentially a measure of how much breast tissue and connective tissue you have in your breast compared to how much fat tissue you have. Higher-density breasts have higher amounts of breast and connective tissue. Lower-density breasts have more fat tissue.

Though it seems like you should be able to tell by feel whether or not you have dense breasts, density is actually only accurately measured by a mammogram. And most mammogram reports now list your breast density using a number scale from one to four, with a density of four being most dense, and a density of one being least dense.

Studies have found that women with dense breasts have as much as four times the risk of developing breast cancer as women with least dense breasts. It's not clear exactly why this is.

## **Benign breast disease**

The one thing about benign breast disease that most women know for sure is that it sounds a bit scary: “Disease? Of my breast?”

Outside of that, things can be a bit less clear – and for good reason. Benign breast disease is a complex, often confusing condition, and even some doctors can have trouble describing it accurately.

So, what is benign breast disease? It’s the broad term given to a wide range of breast conditions that aren’t cancer. Some types of benign breast disease increase the risk of breast cancer, but, fortunately, most do not. There are several categories of benign breast disease.

*Non-proliferative:* The least serious types of benign breast disease are those often referred to in scientific circles as non-proliferative conditions. This simply means that the benign disease is made up of tissues and cells that are not growing. The most common examples are cysts. Other types include calcifications (areas of calcium deposits) and gland changes often termed papillary apocrine changes. The term “fibrocystic changes” may also be used to describe non-proliferative benign conditions, though this is a catch-all term that doesn’t really provide any detail on the specific condition. In general, these types of conditions do not increase the risk of breast cancer.

*Proliferative:* Proliferative types of benign breast disease are those that show signs of cell growth, but are NOT cancers. The medical names for these types of lesions include: fibroadenomas, papillomas, radial scars, and hyperplasia (atypical, and without atypia). Being diagnosed with a benign breast disease of the proliferative kind means that you may have an increased risk of breast cancer from one and a half to four times the average risk, depending on the specific type of disease. Of these, atypical hyperplasia raises the risk of developing breast cancer the most, up to fivefold.

Most women diagnosed with benign breast disease don't need to do anything special. Managing the condition generally focuses on the doctor simply confirming the diagnosis and helping relieve any symptoms, like discomfort. In some cases, extra steps may be required to manage risk. For the most serious types of breast disease – such as atypical hyperplasia – this can mean surgery to remove the tissue as well as a personalized screening plan that may include methods like breast magnetic resonance imaging (MRI). Women with atypical hyperplasia may decide with the help of their physicians to take risk-reducing medications, like tamoxifen or raloxifene ([more](#)), which are strongly recommended by expert organizations because they reduce breast cancer risk by around 80 percent, and very rarely have any serious side effects.

Like many other aspects related to breast cancer, it's important to keep benign breast disease in perspective. While some types of benign disease increase risk, most do not, and even the most serious types don't guarantee you'll develop breast cancer, and there are many good options for reducing the risk they do pose.

A doctor knowledgeable about breast conditions – such as one associated with a breast health clinic – is often your best resource for information about the risk related to benign breast disease and how best to manage it.

### **Slow changes highlight the importance of early life**

Most cancers are slow to develop, and breast cancer is no exception. Though some specific sub-types of breast cancer may grow relatively quickly, studies have found that, on average, it takes about 10 years from the time normal breast cells begin to change until they advance to benign disease and then 10 more years for those cells to develop into full-blown invasive cancer (see figure).

While it can be somewhat comforting to know that most breast cancer doesn't develop and spread like wildfire, this long lag does have a downside as well. It means that the cascade of events from normal tissue to cancer can begin much earlier in life than we might normally think.

The average age of a woman diagnosed with breast cancer is around 60 years old, which means that, on average, the transformation of breast cells into cancer may start with cell changes that happen around age 40. Therefore, for healthy lifestyle choices and other behaviors to have the greatest potential to lower breast cancer risk, it's likely best if they're started well before that – in the 30's – and ideally even earlier – in the teens and 20's.

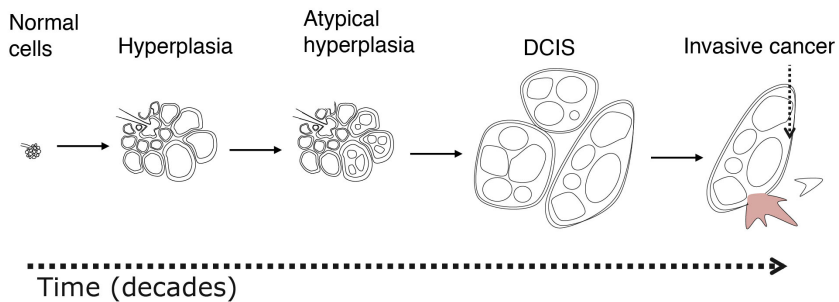


Figure - It can take 20 years on average from the time breast cells begin to become abnormal until they develop into invasive cancer. Here is one pathway from normal cells to atypical hyperplasia to ductal carcinoma in-situ (DCIS) and finally to invasive breast cancer. Wellings et al, 1975.

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### **Did You Know?**

*Breast cancer can take many years to develop. This means that the cascade of events that lead from normal breast tissue to cancer can begin decades earlier than many women might think. It's almost never too early to begin lifelong breast health habits.*

See: Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life

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### **Lobular Carcinoma In-Situ (LCIS).**

Lobular carcinoma in-situ ([more](#)) is a condition similar to some proliferative benign breast diseases ([more](#)). It is marked by a collection of abnormal cells in the lobes of the breast ([more](#)). Although “carcinoma” is used in its name, it is not cancer. Another term used to describe LCIS is lobular neoplasia.

It was once thought that LCIS was a precursor condition that could morph into invasive cancer – similar to the related condition, DCIS ([more](#)) – but it’s now known that LCIS is only a risk factor for breast cancer. It increases risk but doesn’t itself turn into cancer. It is, however, a significant risk factor, raising the risk of breast cancer by 4 – 10 times that of average risk.

## **Some Things are Reproductive Factors**

Unlike a lot of other diseases where the risk factors fall neatly into the categories of “those I can control” and “those I can’t control,” breast cancer has many factors that fall into a kind of gray area. And it is in this gray area where we find most of what are often called “reproductive factors.” These are things like age at having your first menstrual period, age at having your first child, and the amount of time you breastfed your babies.

On a theoretical level, some of these factors are within a woman’s control, but reality is quite different. You’d be hard-pressed, for example, to find a woman who decided to have three children just because she wanted to lower her risk of breast cancer – or any disease. And data suggest that it’s actually societal forces that really drive most of our current choices about family make-up. For example, across countries that have very different approaches to family leave for new mothers and fathers – from very supportive countries in Europe to less supportive countries like the United States – the average age a woman has her first child is pretty much the same across the board – around age 30.

Still, these reproductive factors can have a profound impact on rates of breast cancer in a population. A prime example of this is South Korea. Over the course of just a couple of generations, South Korean women’s reproductive patterns have moved quickly from those of a more developing country to resemble those of the United States and other developed nations. The result has been

an astounding increase in rates of breast cancer – in fact, one of the highest rate increases seen across the globe in the past few years. And it is a change that South Korean grandmothers have been able to view in their granddaughters' generation. We discuss this in more detail [later on](#).

The United States went through similar shifts within the last 150 years or so, as it made its transition from a more rural, pre-industrial society to the more modern and far more urban one we recognize today.

The societal advances that parallel such changes in reproductive patterns surely bring with them great benefits. There's the advancement of technology, improved sanitation and medicine, improvements in gender equality, as well as a slowing of the growth of the global population, which at an estimated nine billion is barely sustainable with our current land, water, and crop production. Still, it may also be important to reassess the constraints of a modern developed society that lead to reproductive patterns that in many ways pressure women to, say, put off child-bearing to later in life and to limit breastfeeding. Can a modern society support varied reproductive patterns that may also help lower the risk of breast cancer? The answer is almost surely "yes," but it will also likely take a purposeful shift and a lot of political will to do so, and to do it in a way that doesn't compromise the advances in gender equality gained over the same periods.



### **Age when I had my first period (menarche)**

The older a woman was when she started her period (menarche), the lower her risk of breast cancer. Studies have found that compared to starting her period before age 15, starting it after lowers risk by about 20 percent throughout life. As with a lot of the reproductive factors, the reason for this comes down mostly to hormones. The later a woman starts her period, the fewer years she will be exposed to the estrogen and progesterone hormones that cycle with each period, and this likely lowers risk. Later menarche also cuts down on the number of years when breast tissue is most vulnerable to harmful changes and exposures that can increase breast cancer risk ([more](#)).

Clearly, the age a woman began her period is not within her control, since it happened in the past. Yet, thinking a bit beyond personal experience, this is actually a factor that could be modified for younger generations – for our daughters, nieces, or granddaughters. Instilling healthier lifestyles early in life – getting them to stay at a healthy weight, eat a healthy diet, and be physically active - can help delay menarche, which could ultimately lower breast cancer risk ([more](#)).

### **Age when I had my last period (menopause)**

The age a woman stops having her period – the age she enters menopause – is the bookend to the age she starts her period. Together, they make up what is called a woman's childbearing age, which for many women falls between ages 15 and 49. In

essence, it's the number of years a woman has functioning ovaries that produce estrogen and progesterone hormones. The later a woman goes through menopause, the more cycles of estrogen and progesterone her body produces, and the greater her associated risk of breast cancer. Compared to women who go through menopause at age 45, those who go through it at 55 experience a 40 percent greater risk of breast cancer.

Like menarche, age at menopause does have some potential to be modified, even by a woman already in mid-life. One analysis of over 50,000 women in the British Breakthrough Generations Study, found that active women and leaner women had significantly earlier ages at menopause than obese women and those who didn't exercise <sup>16</sup>.

The biggest implication of this, though, is for girls and young women. Instilling healthy lifestyles in daughters and granddaughters as early as possible can have a lasting effect on factors linked to breast cancer that are often viewed as unchangeable ([more](#)).

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**Did You Know?**

*Instilling healthy lifestyles in daughters and granddaughters as early as possible can have a lasting effect on certain reproductive factors linked to breast cancer that are often viewed as unchangeable.*

See: Age when I had my first period (menarche)

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**Age when I had my first baby**

The younger a woman is when she has her first baby, the lower her overall risk of breast cancer. This is due to protective changes in the physical make-up of the breast itself as it prepares to produce milk for breastfeeding. Unlike other organs in the body, breasts don't finish development until the first pregnancy. This full development produces molecular changes to breast cells that are thought to make them less susceptible to turning cancerous – over the long term (see figure).

In a strange twist, though, a woman's first pregnancy actually raises the short-term risk of breast cancer. This is likely due to the quick growth of breast tissue that happens in the early stages of pregnancy. And the older a woman is (say, over 35 years old) when she has first child, the greater the risk increase. In fact, studies have shown a steady link between the number of years between a woman's first period and first birth and her breast cancer risk. As a society, this interval has extended to close to 18

years on average in the United States. This is in stark contrast to recent data from China where the interval recently averaged just three years, though this is changing quickly ([more](#))<sup>17</sup>.

### Number of children I had

In a similar vein, each additional baby a woman has confers extra protection against breast cancer. And the closer spaced the births are, the lower the risk. Compared to women who have no children, those who've given birth to two or more have about a 15 percent lower risk of breast cancer (see figure).

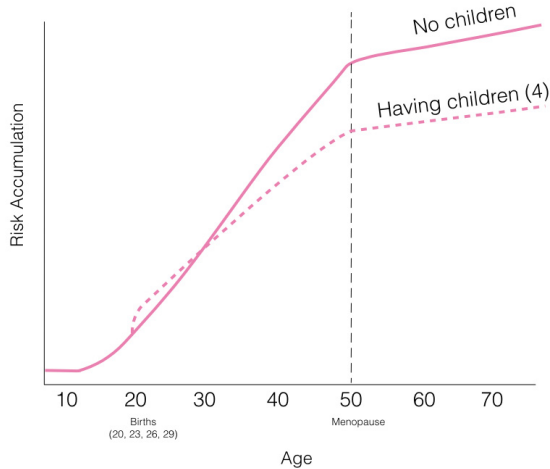


Figure - Number of children and breast cancer risk

The overall impact of this and other reproductive factors becomes even clearer when you compare patterns from before and after industrialization. Before industrialization, girls started periods very late in life – around age 17 years old. Women would have their first child at age 19 years old, then have six babies at regular intervals. Today, girls start their periods at age 12 years old and have one child on average at age 30 years old. The result is a risk of breast cancer four times higher than what it was before industrialization.

This isn't to say we should throw away the advances that came along with industrialization and live in primitive dwellings. What this does show, though, is the important impact that such changes can have on breast cancer risk, which may help open a dialogue about which reproductive and societal factors we can realistically address without giving up the modern advances we've made over the past 150 years.

Certainly one of the most straightforward ways to address some of the modern reproductive breast cancer risks is through fostering healthy lifestyle choices early in life ([more](#)), which can both delay the age a girl has her period and lower the age a woman goes through menopause. These alone could have a substantial impact on risk and without any real shift in other, more enmeshed reproductive factors.

## **Breastfeeding**

There are certainly a lot of beneficial reasons to breastfeed. Among them: it's great for the health of the child, it helps mothers more easily get back to their pre-pregnancy weight, and, from a purely practical standpoint, it's simple and can save a lot of money compared to using infant formula.

Another big boost: it can also lower a woman's breast cancer risk. One large study of over 50,000 women found that breastfeeding for at least one year (combined across all children) can lower the risk of breast cancer by about 20 percent. And recent studies suggest that much of this benefit may come from reducing the risk of two of the most aggressive types of breast cancer – estrogen-receptor negative and triple negative cancer <sup>18</sup>.

For all these reasons, it's great to see that breastfeeding is going through a renaissance of sorts. In the United States, overall rates have taken off over the last decade, and racial differences in breastfeeding – once quite wide – have likewise narrowed. From 2000 to 2008, rates of black women starting breastfeeding rose from 47 percent to 59 percent, with white women's rates rising from 72 to 75 percent <sup>19</sup>.

Though breastfeeding is nature at its best, it's also a natural practice that doesn't always fit nicely into the modern world. Even if a woman starts off breastfeeding in the hospital, continuing to do so after leaving the hospital can be tough when

the best of intentions hit the reality of work schedules, child care schedules, and hectic hours of family life. It is a great example of how important supportive surroundings are to both making and maintaining healthy choices.

The good news is that more and more resources are out there to help women breastfeed, and to breastfeed for longer periods of time. Many hospitals encourage and help mothers initiate breastfeeding right after birth and provide resources to help after they go home. Likewise, an increasing number of businesses offer help for families who want to breastfeed by providing employees paid maternity leave and on-site resources, such as flexible daycare, work-breaks, and private space for nursing or pumping breast milk. Such workplace advances, however, do tend to cluster in better paying jobs and further highlights the need to better address disparities in access to health choices that could benefit all women ([more](#)).

### **Some Things We Can Change**

Everything we've talked about up to this point has been important, but let's face it, it's also been a bit frustrating – focusing either on factors you outright can't control or factors you can maybe control but maybe not. If nothing else, however, it's helped lay out the way breast cancer risk accumulates over time and showed how important youth and young adulthood can be when it comes to setting the stage for later breast cancer risk.

Well, now we're on to more positive territory – the risk factors related to breast cancer that women can actually control (often called modifiable risk factors). It's not the longest of lists, simply because breast cancer doesn't have that many modifiable risk factors. But the ones it does have can have a very important impact.

You'll notice a lot of the usual suspects (weight, exercise) and possibly be surprised by some you'd never really considered. As we have above, we highlight factors that can be especially important in youth and young adulthood.

To be included in this section, a risk factor must have strong evidence backing it. In scientific circles, this means that it must either be a “probable” or “definitive” cause of breast cancer.

## **Weight**

Weight can seem a topic that's been overplayed, getting as much media coverage as it does. But it is actually hard to overstate the importance that overweight and obesity have on health – and that includes their impact on breast cancer.

After menopause, when the ovaries stop producing estrogen, fat tissue becomes the major source of estrogen in the body. It's a bit of a complicated process, but fat cells (adipocytes) naturally convert certain compounds into estrogen. And even though the amount of estrogen that fat tissue produces is small compared to



that produced by the ovaries before menopause, it still has an important impact on breast cancer risk. One key study found that women who gained 22 – 44 pounds during adulthood had a 60 percent greater risk of breast cancer after menopause than those who gained little or no weight over the same period. Those who gained more than 44 pounds had double the risk <sup>20</sup>.

The good news: this risk is reversible with weight loss. A landmark paper from the large Nurses' Health Study found that women who lost 22 pounds or more after menopause, and kept it off, had a 60 percent lower risk of breast cancer than those who maintained or gained weight <sup>21</sup>(see figure).

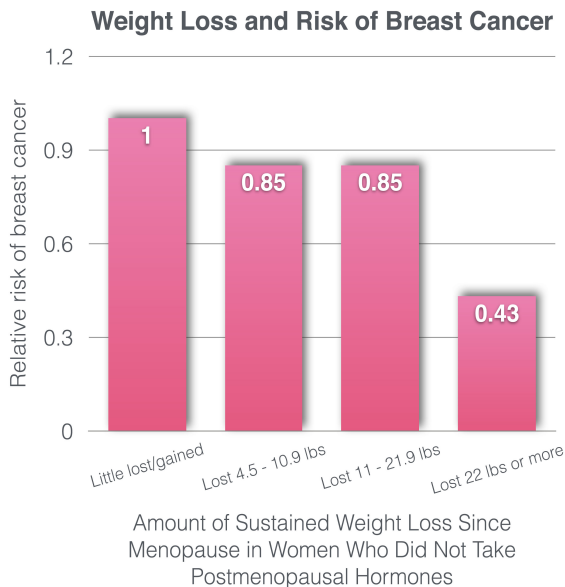


Figure - Weight loss can lower breast cancer risk. Losing 22 or more pounds and keeping it off can lower the risk of breast cancer by almost 60 percent. This means that if 10 women get cancer out of a group of 100 overweight women who didn't lose weight, just 4 women would get cancer out of a similar group of 100 who had lost 22 or more pounds. Data source: Eliassen et al, 2006. ([Tips for reading this figure.](#))

In premenopausal women, the relation between weight and breast cancer risk is less clear than it is in postmenopausal women. But new evidence strongly suggests that weight gain before menopause likely increases breast cancer risk as well<sup>22,23</sup>. And it may not take too many years to see the impact. One study found that rapid weight gain over as little as four years could significantly raise the risk of breast cancer both before and after menopause.

No matter these exact links, clear evidence also shows that obese women who do develop breast cancer before menopause are more likely to be diagnosed with more aggressive and advanced disease than leaner women. Avoiding weight gain through premenopausal years has a lot of long-term benefits.

When it comes to breast health – and overall health - the best approach is to work to maintain a healthy weight throughout life, beginning in youth. Staying at a steady weight is always easier (though certainly not always easy) than working to lose weight and keep it off.

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### **Did You Know?**

*A landmark paper from the large Nurses' Health Study found that overweight women who lost 22 pounds or more after menopause, and kept it off, had a 60 percent lower risk of breast cancer than those who maintained or gained weight.*

See: Quick Tips for Keeping Weight in Check

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### **Physical activity**

As with keeping weight in check, getting regular exercise is also very important when it comes to breast cancer. Study after study has found that being active lowers the risk of the disease, with

one report finding that women who over their lifetimes get the recommended three hours or more of exercise each week have a 20 percent lower risk of breast cancer than women who get little or no activity (see figure) <sup>24</sup>.

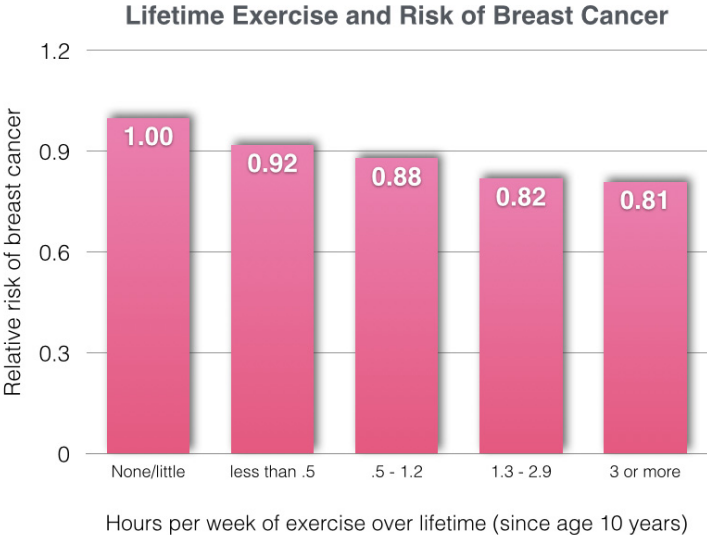
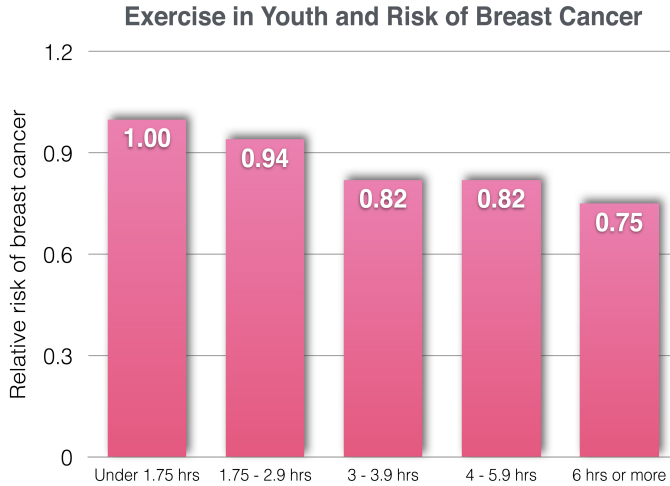


Figure - Regular exercise throughout life can lower breast cancer risk. Women who exercised for around 80 minutes or more per week over their lifetimes have around a 20 percent lower risk of the disease. This means that if 10 women get cancer out of a group of 100 who didn't exercise regularly, just 8 women would get cancer out of a similar group of 100 who exercised regularly throughout life. Data source: Bernstein et al, 2005. ([Tips for reading this figure.](#))

How does exercise lower risk? It's likely through multiple ways. It can improve immune function, which helps the body fight off infections linked to cancer. It can help maintain healthy levels of

hormones in the blood. And it can help women keep their weight in check.

For young girls and adolescents, regular exercise can be a key way to set the stage for breast health later in life ([more](#)). It can not only help develop lifelong healthy weight habits but also delay the age girls begin their periods, further cutting down on lifetime exposure to estrogen and other hormones ([more](#)). A study out of the large Nurses' Health Study II showed that regular physical activity between the ages of 12 and 22 provided the greatest protection against premenopausal breast cancer when compared to activity in older groups (see figure). That few women in this study had had their first baby before age 22 could be key to the extra protection physical activity in early life provided. Breast tissue doesn't fully develop until the first pregnancy ([more](#)), so early life is likely a key time for prevention and breast health later in life ([more](#)).



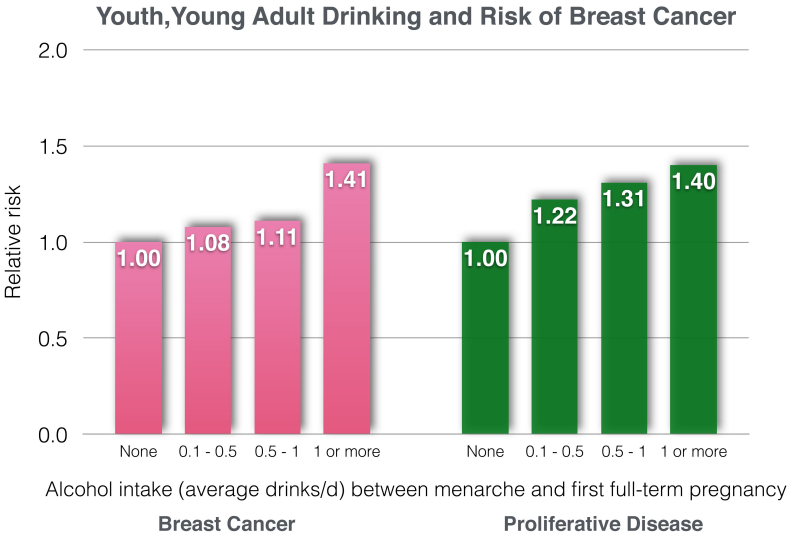
Average hours per week of running between ages 12 - 22 years old

Figure - Regular exercise in youth may be particularly important for breast cancer prevention. Women who did the equivalent of running six hours or more per week when they were ages 12 – 22 years had a 25 percent lower risk of the disease. This means that if 10 women get cancer out of a group of 100 who didn't exercise regularly in youth, just 7 or 8 women would get cancer out of a similar group of 100 who did exercise regularly in youth. Data source: Maruti et al, 2008. ([Tips for reading this figure.](#))

## Alcohol

Alcohol can be tricky when it comes to health. On one hand, moderate amounts can be heart healthy, lowering the risk of heart attack in older adults. On the other hand, even modest amounts can increase the risk of breast cancer. Data show that even just a few drinks a week significantly increases breast cancer

risk, with an average of one drink a day raising risk by 15 - 20 percent. Each additional drink each day on average raises risk by an additional 10 percent (see figure) <sup>25</sup>.



## Adult Drinking and Risk of Breast Cancer

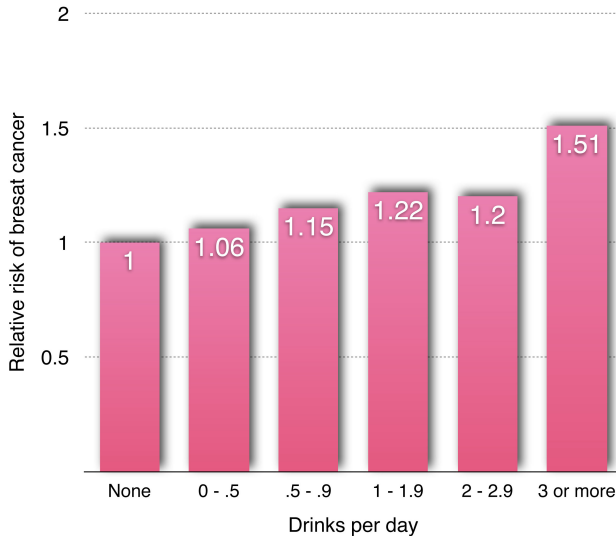


Figure - Drinking even moderate amounts of alcohol in youth/young adulthood (previous page) and older adulthood (this page) can increase breast cancer risk. For adults, drinking one or two drinks a day raises risk about 20 percent. This means that if 10 women get cancer out of a group of 100 who didn't drink, 12 women would get cancer out of a similar group of 100 who did drink one or two drinks a day. Data source: Liu et al, 2013; Chen et al, 2011. ([Tips for reading this figure.](#))

Growing evidence also suggests that a lot of the risk linked with alcohol may accumulate early in life, when rapidly developing breast tissue may be most vulnerable to its effects. One study of over 90,000 women found that regularly drinking about one and half drinks per day between the time a girl began her period and the time she had her first pregnancy increased the risk of breast cancer, as well as harmful proliferative types of benign breast disease, by around 40 percent ([more](#))<sup>26</sup>.



This same study estimated that four percent of all cases of breast cancer could be tied to drinking in early life. With high school and college-aged females binge-drinking at alarming rates, this percentage could very well continue to rise and points to the need for better outreach to inform girls and young women of the long-term risk of breast cancer - and other unfortunate outcomes - that can result from regular heavy drinking.

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### **Parents & Grandparents**

*A lot of the breast cancer risk linked with alcohol may build up early in life, so it's important to have age-appropriate discussions with daughters and granddaughters about alcohol use and its risks - health and otherwise.*

See: Older daughters (11 years - 17 years) - Alcohol

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As an adult, choosing whether or not to drink is really all about balance and what your ultimate health goal is. Moderate drinking - no more than 1 drink a day for women - likely has overall health benefits but does come with some risks, like an increased risk of breast cancer. If breast cancer is a particular concern, avoiding alcohol is one key way to lower risk, and you can improve your

heart health through other means, such as focusing on regular exercise and healthy diet.

### **Smoking**

Ask a group of people to name one cause of cancer and the large majority will likely say: smoking. And, of course, they'd be correct. Smoking is an established risk factor for over 15 different cancers, including breast cancer.

Overall, being a current smoker, or having smoked in the past, raises the risk of breast cancer by about 10 – 15 percent. The strongest data, though, mimic those for alcohol and show that smoking early in life – between a woman's first period and first pregnancy – has the greatest impact on cancer risk. A recently released long-term Norwegian study of over 300,000 women found that those who smoked for at least 10 years before their first pregnancy had a 60 percent increased risk of breast cancer compared to those who never smoked <sup>27</sup>.

### **Birth control pills**

For something so widely used, it can come as a bit of surprise to hear that birth control pills can increase the risk of breast cancer. But this doesn't mean you should stop taking them or counsel your daughters or granddaughters to do the same. There are a lot of things to balance when making the decision to take – or to stop – birth control pills.

Looking at breast cancer, standard birth control pills increase the risk of the disease by about 20 – 30 percent while women are taking them. After stopping, this risk starts to drop and pretty much disappears after a decade. Right now, it's unclear how some of the newer formulations of pills, like the mini pill, affect breast cancer risk. Some studies have shown a slight increase in risk. Some have not.

The health effects of birth control pills, though, reach beyond breast cancer. They can increase the risk of heart attack and stroke, especially in women over 35 and in women who smoke. But they can also lower the risk of colon cancer, ovarian cancer, and uterine cancer, and of course – and quite importantly – help prevent pregnancy.

In the broad scheme of things, birth control pills are one of the less important factors linked to a woman's risk of breast cancer. This is especially so given that most women who take birth control pills are relatively young – when the overall risk of breast cancer is very low to start. So even a 30 percent increase in risk doesn't greatly increase a woman's chance of getting the disease in her 30s.

### **Postmenopausal hormones**

Most women who've gone through menopause would agree: it's just no fun. Symptoms – like hot flashes, night sweats, vaginal

dryness, and poor sleep – can range from being bothersome to being quite severe, even debilitating.

Menopause – officially defined as the time when a woman has gone a full year without having a period – develops slowly over a number of years as the ovaries slow down and eventually stop producing the hormones estrogen and progesterone. Symptoms of menopause can come on when periods first become irregular, or they may not develop until after periods have stopped completely.

Boosting low hormone levels by taking postmenopausal hormones is an effective way to alleviate many moderate or severe symptoms of menopause. However, results from numerous studies show that postmenopausal hormones can also increase the risk of many serious conditions, including breast cancer.

The exact mix of risks and benefits depends largely on the type of hormones women take. Combined estrogen-plus-progestin (a synthetic progesterone) is the most common choice in the United States and is prescribed for women who still have a uterus. Taking estrogen by itself can increase the risk of uterine cancer; combining estrogen with progestin helps counteract that risk. Women who've had a hysterectomy and no longer have a uterus (and are therefore no longer at risk of uterine cancer) will most

often be prescribed postmenopausal hormones that contain only estrogen.

Not too many years ago, postmenopausal hormones were prescribed for a very large proportion of menopausal women, and they often took them for many years. The prevailing thinking was that such long-term use had few risks and, in addition to helping relieve menopausal symptoms, could also prevent heart disease and osteoporosis. At the height of use, around 40 percent of postmenopausal women in the United States took postmenopausal hormones.

Things changed drastically, though, in the early 2000s when the results of the large Women's Health Initiative (WHI) clinical trial were released and showed that the risks and benefits of these hormones were much more complex than originally thought<sup>28,29</sup>. These findings, combined with others, showed that hormone use could have significant risks, with estrogen-plus-progestin formulations having generally greater risks than estrogen-alone formulations.

### *Combined estrogen-plus-progestin*

Overall, the evidence shows that taking combined estrogen-plus-progestin hormones for just a few years increases the risk of heart disease, stroke, serious blood clots, dementia, gallbladder disease, incontinence, and breast cancer, while it lowers the risk of hip fracture and colon cancer. After hormone use stops, many

of these effects slowly go away, but not all. Hip fracture risk remains lower for a number of years, while the risks of blood clots, gallbladder disease, incontinence, and breast cancer remain higher.

The longer women take estrogen-plus-progestin hormones, the higher the risk of breast cancer. Taking them for under 5 years increases breast cancer risk by 30 – 50 percent. Taking them for 5 or more years doubles risk <sup>28,30</sup>.

### *Estrogen-alone*

The evidence for estrogen-alone hormones shows that it also raises the risk of stroke, blood clots, gallbladder disease, and incontinence after just a few years of use, but that it does not raise the risk of heart disease. As with estrogen-plus-progestin, estrogen-alone hormones also lower the risk of hip fracture. Most increased risks largely go away after women stop taking hormones.

How estrogen-alone hormones affect breast cancer risk, though, is still being debated. The WHI found that estrogen-alone use actually lowered breast cancer risk by 20 percent in the 10 years after women stopped taking hormones <sup>29</sup>. Other large, well-designed studies, however, have found that it can increase risk. Results from the British Million Women Study, for example, showed that the risk of breast cancer increased by around 40 percent in women who started taking estrogen-alone hormones

within 5 years of going through menopause <sup>31</sup>. This risk increased to 65 percent in healthy weight women, likely because excess weight can mask the true impact of hormone use.

Though the WHI findings showing lower breast cancer risk with hormone use are certainly intriguing, they also run counter to much of what we know about breast cancer - that estrogen levels are closely tied to cancer risk. One touchstone paper that combined the results from nine well-designed studies found that as blood estrogen levels increased, the risk of breast cancer increased as well <sup>32</sup>. Women with the highest concentrations had over twice the risk of those with the lowest concentrations.

So, what's going on?

Well, it's possible that the make-up of the WHI study population as well as the timing of hormone use skewed the WHI results to show that hormones use was protective. Most women who take postmenopausal hormones take them close to the time of menopause, and it's this period of time when estrogen-alone hormones are most likely to raise breast cancer risk. The majority of women in the WHI, however, were 60 years or older when the study started – well past menopause. On top of this, the large majority were also overweight, which can mask the effect of hormones on risk.

Though there's still an open debate, the most compelling data seem to show that estrogen-alone formulations likely increase breast cancer risk when taken close to the time of menopause. This risk likely goes away after stopping.

### *Newer formulations*

In addition to standard postmenopausal hormone formulations, there are many newer options for women, such as low-dose formulations and transdermal patches that deliver hormones through the skin. Though these new formulations may have fewer risks than standard options, there are currently no good data on their exact effects on health.

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#### **Did You Know?**

*Postmenopausal hormones can effectively treat moderate to severe symptoms of menopause, but they should not be used long-term.*

See: Avoid Postmenopausal Hormones

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So what does all this mean for a woman nearing or in the middle of menopause?

It's actually pretty simple.



Postmenopausal hormones can effectively treat moderate to severe symptoms of menopause, but they should not be used long-term. The risks are simply too high for the benefits they provide, and other good options exist for preventing conditions like bone loss.

If after a detailed discussion, you and your doctor decide postmenopausal hormones may be right for you, you should use them for the shortest time possible – no more than one to three years.

### **Risk-reducing medications - for women at high risk of breast cancer**

Let's face it. No one wants to be told that they're at high risk of breast cancer (or any cancer for that matter). Yet, for those women who have to bear this bad news, there is at least one small silver lining: there are some good medications that can help lower risk.

Tamoxifen and raloxifene are the two most common, and each has been approved by the FDA for breast cancer prevention in high-risk women. They belong to a class of drugs called selective estrogen-receptor modulators (SERMS) and work by blocking cancer-promoting estrogen from breast cells.

It's a lot like locking the gas cap on a car. If you can't put gas in the tank, the car won't go. In the same way, tamoxifen and

raloxifene block estrogen from those cells that would use estrogen to become cancerous and then grow.

Each drug is taken as a pill once a day, usually for five years.

These medications are reserved for use in high-risk women, which is technically defined as having a 5-year risk of breast cancer of 1.67 percent or higher ([more](#)). This means that a woman has a 1.67 percent chance of developing breast cancer over the next five years. By comparison, the average 45-year-old woman has a 5-year risk of about 1 percent. The standard tool used to assess 5-year risk is the National Cancer Institute's [Breast Cancer Risk Assessment Tool](#).

Studies have found that tamoxifen and raloxifene can cut the risk of breast cancer by about half, with tamoxifen being a bit more effective than raloxifene. This means that a high-risk woman who has a 5-year risk of breast cancer of four percent can cut this risk to around two percent by taking tamoxifen.

As with all medications, there are some potential side effects that need to be weighed against the benefits. Tamoxifen can slightly increase the risk for blood clots, strokes, cataracts, endometrial cancer, and uterine cancer. Raloxifene can slightly raise the risk of stroke and blood clots. Overall, raloxifene has lower rates of serious harms compared to tamoxifen. And raloxifene may be the preferred option for women who still have a uterus (have not had

a hysterectomy), since tamoxifen slightly raises uterine cancer risk. Raloxifene, however, has not been tested or approved for use in premenopausal women, so it is currently only used by postmenopausal women. Tamoxifen is prescribed for both premenopausal women and postmenopausal women.

Researchers have taken a hard look at the data on the potential side effects and benefits of these medications and come up with a guide, of sorts, to help physicians and high-risk patients decide if tamoxifen or raloxifene might be right for them (original scientific paper and detailed tables are [available here](#))<sup>33</sup>. The results of their analysis show that risk-reducing medication often makes sense for women who are younger and higher risk. The older a woman is and the lower her risk, the more likely it is that the potential harms of tamoxifen and raloxifene outweigh any potential prevention benefit. This is simply because most of the serious side-effects of these medications – like stroke and blood clots – become more common as people age. As always, a doctor knowledgeable about breast conditions is the best source of information about your balance of potential harms and benefits of tamoxifen or raloxifene.

In addition to tamoxifen and raloxifene, there is also a third choice for reducing risk in postmenopausal women at high risk - an aromatase-inhibitor named exemestane. Though not yet FDA-approved for breast cancer prevention, exemestane is approved for breast cancer treatment and is included in guidelines as a

possible alternative to tamoxifen and raloxifene for reducing breast cancer risk<sup>13</sup>.

The decision to take risk-reducing medications should not be made lightly. Yet, it's also important that high-risk women make informed decisions about the potential benefits in relation to the potential harms. Risk-reducing medications are certainly not right for every high-risk woman; the evidence clearly shows that. At the same time, their unmet potential to reduce the burden of the disease is a huge loss. Close to eight million women ages 50 – 69 years old in the United States could benefit from raloxifene for prevention; yet only around 120,000 take tamoxifen or raloxifene for prevention (see figure)<sup>34-36</sup>.

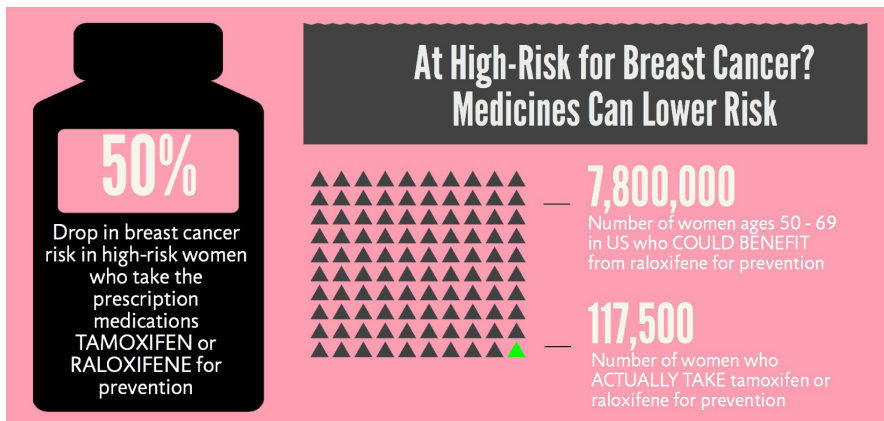


Figure - The prescription medications tamoxifen and raloxifene are FDA-approved for prevention in women at high risk of breast cancer. Though they can cut risk in half, only a small number of women eligible to benefit actually take them. Data sources: Chen et al, 2007; Waters et al, 2012.

## **Other factors**

Outside of the major risk factors discussed above, there are a number of other modifiable factors that are likely also related to breast cancer risk. Yet, because the science behind them may not be quite as strong or the factors themselves may not be quite as controllable, we've pulled them into this separate section. These factors really run the gamut, from diet to work schedules.

Because most of these factors have only been studied in women who are midlife or older, some of the uncertainty in these results may have to do with the factors simply not being studied early enough in life. As we've discussed, a woman's breasts don't fully develop until she's had her first child ([more](#)). The period of time before that happens can be a key period when it comes to building up breast cancer risk. If factors are studied only in older women, studies can miss this key window and find that a factor has no significant impact on risk when it actually may. More studies that include younger women will help tease out such details.

## **Diet**

Besides alcohol, there really aren't too many compelling food or diet-related factors linked to breast cancer risk. Probably the most important is simply calories. Eating too many leads to weight gain and the increased risk that goes with that.

These others may have some important links to breast cancer risk, but their exact roles are still being figured out.

**Soy.** There is some evidence that a diet high in soy - especially during childhood - can help protect against breast cancer. But this can be a complicated issue because of the geographic region where most of this evidence originates: Asia. Asians have historically had low breast cancer risk, and their diets are traditionally high in soy and isoflavones, the estrogen-like compound in soy. One large analysis combining results from multiple studies found that diets with high amounts of soy were associated with a decreased risk for breast cancer compared to diets with lower amounts<sup>37</sup>. What this means for most American women, however, is unclear. Studies in the US and other western countries have typically not found a link between soy intake and breast cancer, but this could largely be due to wildly different diets between the two regions. The *highest* intake in the US is typically 80 percent below the *lowest* intake in Asia (see figure). Should diets shift to resemble those of Asia, it's likely that US-based studies would begin to reveal breast cancer benefits with soy as well.

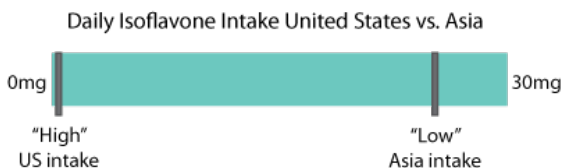


Figure - The highest soy intake in the United States (measured by isoflavone intake) is well below the lowest intake in Asia. Data source: Wu et al, 2008

*Fruits, Vegetables, and Nuts.* There's growing evidence that diets that are primarily plant-based protect against breast cancer. One large study of over 90,000 California teachers found that those women who ate the most fruits and vegetables had a nearly 15 percent lower risk of breast cancer overall <sup>38</sup>. And an analysis of 20 different studies found a similar protective effect for a hard-to-treat type of breast cancer (estrogen-receptor negative cancer).

Perhaps more intriguing, a large study that followed 9,000 adolescent girls for over fifteen years found that those who had eaten the most nuts and other vegetable protein over that time had a significantly lower risk of developing harmful types of benign breast disease ([more](#)) when they reached age 30 <sup>39</sup>. The strongest protection came from peanuts or from a diet's inclusion of peanut butter, nuts, beans, lentils, soybeans and corn.

Related findings have suggested that diets high in animal fats – like those found in whole milk, cheese, and red meat - may increase risk.

So what's the overall message about food choices and breast cancer risk? It's that eating an overall plant-based diet – filled with soy, fiber, produce, and nuts – is likely to provide some breast health benefits for all women. And if it's started in childhood and continued throughout life, it's likely to confer ever greater protection against breast cancer.

*Vitamin supplements.* Right now, there is no good evidence that multivitamins, or any other supplement, can broadly protect against breast cancer – except in one specific group: women who regularly drink alcohol. In this group, those women who take a multivitamin with folate on most days of the week essentially counteract the added risk caused by regularly drinking alcohol. It's not perfectly understood why this might be. It is known, though, that the body uses folate in the metabolism of alcohol. So, regular drinkers may be burning through enough folate that they regularly have low blood levels of the vitamin. Taking a multivitamin that contains folate may help bring low levels back up to more normal levels. Because folate plays a role in keeping cell DNA error-free, keeping folate levels normal may help protect against cancer growth or development.

### **Night Shift Work**

You may have filed this away in the “crazy study” category if you’ve read about it before, but there is actually good evidence that working the night shift for long periods of time can increase the risk of breast cancer by up to 50 percent <sup>40</sup>. Though it’s currently unclear exactly how night shift work increases risk, it could have to do with levels of the hormone melatonin. Melatonin levels in the blood normally rise at night during the normal sleep cycle. When people are exposed to artificial light during what are normal hours of sleep – as night shift workers are – levels of



melatonin can remain low. And low melatonin levels have been linked in some studies to higher rates of breast cancer.

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**Did You Know?**

*There is good evidence that working the night shift for long periods of time can increase the risk of breast cancer by up to 50 percent.*

See: For Good Measure

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## **X-Rays and Other Medical Imaging that Uses Radiation**

X-rays and other medical scans that use radiation are a common part of life these days - so common, in fact, that we rarely give them a second thought. And most of the time, that's fine.

Although there is likely no safe amount of radiation exposure when it comes to cancer risk, the typical X-rays most people get emit low enough levels of radiation that any small increase in cancer risk is usually far outweighed by their benefits. And detailed analyses have shown that the same goes specifically for mammograms (which are X-rays of the breast) ([more](#))<sup>41</sup>.

Yet, not all types of medical scans emit the same amounts of radiation. Computed tomography (CT or CAT) scans use hundreds

of times the radiation of the average chest X-ray. And the Institute of Medicine estimates that in the United States each year approximately 1,800 breast cancers could be associated with their use <sup>42,43</sup>.

Of course, this is not an astronomically high number, but it is not insignificant, either. With a disease like breast cancer that has a relatively small number of risk factors that women can control, any factor that can be changed for the better to improve risk is an important one. As with other factors we've discussed, exposure to radiation in youth and young adulthood can have a particularly important impact on breast cancer risk later in life.

To reduce unnecessary exposure from CT scans, speak freely with a physician when a scan is being considered. Ask about its necessity and if there are other options that may be just as good ([more](#)). Clearly, if it's an emergency and time is critical, prompt medical care is much more important than any concerns related to excess CT scans.

### **Common Myths and Other Things Not to Worry About**

More so than ever, there's a lot of misinformation out there about the causes of breast cancer. While the vast information free-for-all that is the Internet is a wonderful thing, it also gives voice – and often a very loud and seemingly authoritative voice – to many ideas about the causes of breast cancer that have no basis in science.

One such factor that most women will recognize, for example, is the use of antiperspirants/deodorants. On and off this has been a popular focus of media stories and web posts, yet there are absolutely no good data linking their use with breast cancer. And this marks a trend with many of these factors – the quest to blame current-day high rates of breast cancer on advents of the modern world. Yet, with very few exceptions, these don't pan out.

Probably the most well-known group of factors that cause a great deal of fear but that have not been found to increase breast cancer risk are environmental contaminants. Despite many well-designed studies of chemicals like bisphenol A, phthalates, benzene, ethylene oxide, and many pesticides, no links have yet connected them with an increased risk of breast cancer<sup>43</sup>.

It's understandable that such contaminants in the environment raise concerns – and they should. They've been linked to other health conditions, including other cancers, and have implications for long-term environmental sustainability. Yet, when it comes to breast cancer, no links have yet emerged. So, while it's an important issue to follow, at a certain point, it's sensible to rely on the findings from well-designed studies. Doing so then frees up the opportunity to focus time, energy, and resources on those factors that we know can have an important impact on breast cancer risk – like weight, exercise, and tobacco ([more](#)).

While we can't detail all the factors *not* linked to breast cancer, here's a core list of the higher profile factors that the science currently says have no influence on breast cancer risk. Our colleagues at Susan G. Komen have previously [detailed the science \(or lack thereof\) behind most items on this list.](#)

**Selected factors not linked to breast cancer risk:**

- Abortion
- Antiperspirant/deodorant
- Bras
- Breast implants
- Coffee/caffeine
- Electric blankets
- Hair dyes
- Power lines (electromagnetic fields)
- Organochlorine pesticides
- Dioxins
- Polychlorinated biphenyls (PCBs)
- Genetically modified foods (GMOs)

**Tools to Assess Risk**

For many women, it all boils down to one question when it comes to breast cancer: *What's my risk?* And that's perfectly understandable. If you're concerned about breast cancer, knowing your risk (even if it's higher than you'd like) gives you information you didn't have before and allows you to act on it.

More than ever before, women have access to tools that can quickly, easily, and relatively accurately assess their risk of breast cancer. Yet, risk prediction is a tricky business, which even the scientists who develop these tools will tell you.

Much of the reason for this boils down to the fact that these tools take findings from studies done in large groups of women and apply them to an individual woman. And the simple fact is it's much easier to predict what might happen to a group of people than to a single person. Out of 1,000 women with a certain set of risk factors, for example, it's not too hard to look at past research studies and accurately estimate what percentage of the women will go on to develop a certain disease. Much harder, though, is picking which specific women of the 1,000 will get the disease.

It's similar to making a six-month weather forecast.

Meteorologists can look at past weather patterns and predict with good accuracy that, say, this coming March it's going to rain on 11 out of 31 days. It is harder, though, to predict long-term on which specific dates in March it's going to rain.

Despite such difficulty, tools that estimate cancer risk are getting more accurate as understanding of the disease grows. And certain online sites can be very useful guides to opening a dialog with providers or other health professionals about cancer risk and lifestyle choices.

Of course, not all risk assessment sites are created equal, and people must be informed consumers of the sites they use ([more](#)). It's best to start with sites from known reputable organizations, such as universities, well known health organizations, and the federal government. When seeking out cancer risk assessment tools, it's also very important to look for documentation showing that developers of the site have experience in the field. While it's easy to put up a cancer risk quiz on the web, it's much harder to get it right.

The most high profile of well-established sites is probably the National Cancer Institute's (NCI's) [Breast Cancer Risk Assessment Tool](#). Originally developed to identify high-risk women who could take part in a federal study of tamoxifen and breast cancer prevention ([more](#)), the tool has since been modified many times and entered into common use by physicians, researchers, and the general public. Despite being scientifically validated, a common criticism of this tool is that it doesn't assess many of the modifiable risk factors known to impact risk, like obesity, exercise, and alcohol intake.

Washington University School of Medicine also maintains a high-profile, validated site that estimates breast cancer risk, called [Your Disease Risk](#)<sup>44</sup>. (Disclosure: authors of this book maintain the *Your Disease Risk* tool). Unlike the NCI tool, *Your Disease Risk* includes many lifestyle factors and presents results and personalized prevention plans for the general public. Washington

University also maintains an iPad app called [Zuum – Health Tracker](#). *Zuum* is a distilled version of the *Your Disease Risk* tool, optimized for time-pressed environments, like health fairs, doctors offices, and college dorm rooms. A shortened version of the *Your Disease Risk* tool appears in the appendix of *Together* ([more](#)).

Outside of online risk assessment tools, there's also been an explosion of personal genetic testing services. Once the sole purview of genetic counselors and medical geneticists, lengthy gene profiles can now be ordered by anyone for as little as \$99. Coming under increasing scrutiny by regulators, these profiles can be quick to provide very definite sounding links between certain genetic traits and the risk of breast cancer and other diseases. It's important, though, to be very cautious about these results and the conclusions any testing service draws. If it highlights any major concerns, it's important to confirm them with your doctor or a genetic specialist.

Such testing is still in its infancy, and the accuracy of tests and the conclusions drawn from them need to be much better validated and better studied. Even in best-case settings, with testing being done by experienced researchers, initial studies of broad-based genetic testing in the general population have found that it adds very little useful information in identifying which women will go on to develop breast cancer and which won't <sup>45</sup>.

## Options for Women at High Risk

If you feel that you or a family member is at high risk of breast cancer and you haven't spoken to a doctor about it, that's the first thing you should do. No matter how accurate an online tool or personal genetic testing service is, the results should be confirmed in person by a doctor. Only after that can you begin to consider what – if any – special steps to take to manage risk.

Traditionally, any woman with a five-year risk of breast cancer of 1.67 percent or higher is considered to be at “high risk” for the disease. This was the cut point first used in the landmark Breast Cancer Prevention Trial, and since then, it's been used as the risk level where more serious breast cancer risk begins. It's most often assessed using the National Cancer Institute's [Breast Cancer Risk Assessment Tool](#).

A number of different factors can push women into this high-risk category. The most important tend to be age ([more](#)), history of serious benign breast disease (like atypical hyperplasia) ([more](#)), and a family history of breast cancer ([more](#)). Depending on specifics, each of these alone can be sufficient to place a woman in the high-risk group. But other factors can also play a role and, when added together, can significantly increase a woman's risk. These include reproductive factors ([more](#)) - like age at first period, age at menopause, and number of children - as well as certain health behaviors - like weight, physical activity level, and history of postmenopausal hormone use.



If you've talked with a doctor and been told that you're at high risk of breast cancer, there are a number of ways to manage your risk. Which one a woman chooses – if any – depends on many factors. Two of the most important are her level of risk and the specific factor (or factors) that got her there.

One way to manage risk is through enhanced screening. With this option, you may have additional screening tests, like breast MRI, and/or you may have screening tests done more often or earlier. The goal is to find any cancer that does develop in an early, more treatable stage. Another way to manage risk is with something called chemoprevention. With this option, you take prescription risk-reducing medications like tamoxifen or raloxifene that can cut risk in half or more ([more](#)). For women at very high risk of breast cancer, such as from a *BRCA1/2* mutation ([more](#)), there is also prophylactic bilateral mastectomy. With this option, you have surgery to remove the breasts (and sometimes the ovaries as well), which drastically cuts down on the risk of breast cancer.

Deciding which approach – or combination of approaches – is best is a personal choice and depends largely on a woman's specific risk profile, her tolerance for risk, and her tolerance for uncertainty. There is no right choice or wrong choice. Talking in detail with a doctor (and getting a second and even third opinion) is key to deciding the best way forward.

And even for women at substantially increased risk, a healthy lifestyle remains important. Studies show that it can not only help lower breast cancer risk but also help prevent other important diseases, like diabetes, heart disease, stroke, and osteoporosis – diseases that remain important for all women throughout life ([more](#)).

## **Simple Steps to Prevent Breast Cancer**

We've gone into some good detail about the risk factors for breast cancer ([more](#)). Now, it's time to distill these all down to some useful messages that can help you – and your daughters and granddaughters – prevent the disease. We'll cover many things already discussed but in a more practical way. The focus is much more on “how” than “why.”

In each section, we'll go over the key things you need to know about lowering your risk and maximizing your breast health; provide some tips and tricks for putting those things into practice; and list places you can visit for next-level help and information.

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## Nine Steps to Prevent Breast Cancer

- *Keep weight in check*
  - *Be physically active*
  - *Avoid too much alcohol*
  - *Don't smoke*
  - *Breastfeed, if possible*
  - *Avoid birth control pills, particularly after age 35 or if you smoke*
  - *Avoid postmenopausal hormones*
  - *Find out your family history*
  - *If high risk, consider risk-reducing medications*
- 

Now, not every woman will be able to put every one of these key behaviors into practice. And even if she could, it could be an impractically big effort to do so. What this list should be in practice is a guide to improving breast health - sensibly. Focus on the areas that apply to you, and make a plan for making those healthy changes. It's usually best to tackle one area – or at most two – at a time. Go slow with new changes and keep up with them

until they take hold. After that, move on to others. A healthy lifestyle is one best built slowly.

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### **Did You Know?**

*A healthy lifestyle is one best built slowly.*

See: Simple Steps for Preventing Breast Cancer

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You may notice that one key practice is missing from this list: breast cancer screening. It's not because we don't think screening is important, it's simply that mammograms and clinical breast exams do not help prevent breast cancer. Rather, they help catch it early after it has developed – making it more treatable. Don't worry; we devote a whole section to screening later ([more](#)).

### **Keep Weight in Check**

OK. This message is easy to tune out because it gets said so often, but maintaining a healthy weight is a great goal for everyone. Two-thirds of all women in the United States are either overweight or obese. And excess weight is a key contributor not only to breast cancer risk but also to the risk of heart disease, stroke, and diabetes.

So, what should be your weight goal? The first goal should always be to maintain your weight – to keep it steady. Weight gain can be sneaky. It creeps up on most people. One pound here, another pound there. Then you step on the scale and suddenly realize

you've put on 20 pounds over the past 10 years. This happens to a lot of people, so the best thing you can do is try to keep from gaining weight. This applies pretty much to all women, no matter what their current weight.

If you're overweight, the next goal is to try to lose weight. Losing just 5 – 10 pounds and keeping it off can significantly lower the risk of breast cancer, and it's a very realistic goal. Ideally, the next goal is bringing your weight down to a BMI between 18.5 – 23 ([BMI calculator](#)). For a woman who is 5' 5", that's a weight between 111 – 138 pounds.

Losing weight isn't always easy, but it's far from impossible, and some practical tips can really help you succeed.

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## Quick Tips for Keeping Weight in Check

- *Be physically active every day*
  - *Limit time in front of the TV and computer*
  - *Eat a diet rich in fruits, vegetables, and whole grains*
  - *Choose smaller portions, and eat more slowly*
  - *Choose water and keep sugary drinks to a minimum*
  - *Step on the scale every day*
  - *Find people who support you*
- 

### **Tips and Tricks - Weight**

*Be physically active every day.* Regular activity is one of the best ways to keep weight in check. Choose things you enjoy that get you moving and shoot for at least 30 minutes a day. Studies show that 60 minutes or more is even better for weight loss.

*Limit time in front of the TV and computer.* Screen time – the phrase given to time spent with our TVs, computers, phones, and tablets – is a double whammy when it comes to weight and health. Not only does it up the amount of time we spend each day in complete inactivity, but it also makes it more likely that we'll overeat (especially unhealthy foods) while we're sitting in front of those screens. Shoot for under two hours of non-work screen time each day. Less is even better. Zero is ideal.

*Eat a diet rich in fruits, vegetables, and whole grains.* Eating a lot of plant-based foods can help keep appetite and weight in check. Not only are they very filling but they also keep at bay wild swings in blood sugar that make you want to eat – even if you've just had a big meal. On top of this, there's growing evidence that plant-based food can help lower breast cancer risk, outside of their influence on weight. Shoot for at least three servings of whole grains a day, five servings of fruits and vegetables, and keep red meat to a minimum.

*Choose smaller portions, and eat more slowly.* It can seem unlikely that eating food slowly and choosing smaller portions can help people eat less, but there are actually data to back this up. At the most basic level, eating slowly gives our stomachs time to tell our brain when we've had enough food. As competitive hot dog eaters will tell you, it takes about 10 - 20 minutes for the brain to register when the stomach's full. If you eat too quickly, you can down a plate of food, grab more, and then down that before your

brain knows what hit it. By then, you may have had twice as much food as you needed or even really wanted. So why not slow down and enjoy your food? You won't even miss the extra food you're not eating.

*Choose water and keep sugary drinks to a minimum.* Sugary drinks – like, sodas and energy drinks – can sure taste good, but they really do nothing good for you. They have little or no nutritional value, are packed with calories, and have been shown to increase the risk of obesity and weight gain. The best choice is to avoid sugary drinks completely and choose water instead. It can be a tough transition, but you don't need to do it all at once. Each week, slowly cut back on sodas and energy drinks, and before you know it, you'll be down to zero and likely not missing them at all. Keeping a water bottle handy wherever you go can really help. And be sure to keep 100 percent fruit juice in check as well. Though it's healthier than sugary sodas, 100 percent juice is still packed with calories. Whole fruit is always a better choice. If you do drink 100 percent fruit juice, keep it to just 4 – 6 ounces a day.

*Step on the scale every day.* Yes. Every day. It may sound like a nightmare – confronting those pounds every morning – but research shows that your bathroom scale can be a great tool when it comes to losing weight and keeping it off. Weighing yourself regularly helps you avoid being surprised by creeping annual weight gain and can help you make necessary adjustments to stay on track to losing or maintaining weight. Perhaps surprisingly,



weighing yourself every day can also let you know if you're losing weight too quickly. Healthy weight loss is around a pound or two a week. Losing weight quicker than this – while initially exciting – can make it harder to keep weight off over time.

*Find people who support you.* You may be a rugged individual with a deep streak of independence, but when it comes to losing weight and keeping it off there's some pretty good evidence that you may just want to surround yourself with people who support your efforts. It can be family, friends, or a weight loss discussion group, but the key is to find people who can not only provide practical support for weight loss – with recipes and other tips – but also emotional support and encouragement that help keep you on track and heading toward your goals. Many hospitals, medical centers, and recreation departments host weight loss support groups. Some commercial weight loss programs – like Weight Watchers – also have programs with support components. Online options exist as well.

### **Mindful weight loss**

Stop. Read this. Now read this slowly. S l o w l y. Now take a slow deep breath in and count “one.” Take a slow breath out and count “two.” Now repeat this three times. S l o w l y.

You've just had a mindful moment. It's a real rarity in today's busy, smartphone-obsessed world. And that's a problem according to some health experts, because there's growing

evidence that adding more mindful moments to our lives may be good for overall health by helping us eat better and keep our weight in check.

While mindfulness may sound somewhat mystical, it's really just the practice of slowing down, turning off as many distractions as possible, and focusing on the thing that is happening in front of us right at that moment. By doing this we're able to more deeply appreciate each experience in our lives and to be more in tune with both our mind and body.

Applying mindfulness to the way we eat can have many benefits. It can put us in better touch with our hunger cues, so we're better able to realize when we're actually hungry. It can help us know during a meal when it's time to put the fork down because we've had enough. And it can even allow us to better appreciate healthy foods by focusing on the benefits they provide us.

Overall, mindfulness has a lot of potential to help people make better food and eating choices. And it's really quite easy to get started. Begin with the mindful eating tips below. If these spur you on, and you're interested in exploring things more in-depth, there are a number of mindful eating books by reputable doctors and researchers.

*When you eat, just eat.* Whether you're eating alone or sitting down as a family, make sure all other distractions

are limited. Turn off the television. Turn off the radio. Turn off the iPod. And definitely, get out of the car. This helps you to focus on the food and your experience of eating it. You'll find you appreciate your food more and may actually feel like eating less of it.

*Take a moment.* When you sit down to a meal – wherever you are – take some time to just be silent before you start eating. You don't need to do anything. You don't need to think anything. All you need to do is sit quietly. Whether it's for five seconds or 60 seconds, taking that little bit of time can be a great way to rest your mind and focus on the food you're about to enjoy.

*Eat slowly.* Meals are meant to be savored – not rushed through. So slow down and enjoy your food; give your mind the chance to tell your stomach when it's had enough.

*Choose smaller portions.* Part of being mindful is appreciating what's in front of us. When we do this with our food, you may find that you get as much satisfaction from a plate of smaller portions than a plate (or two) of larger portions.

*Appreciate water.* There's little in life that is more simple and straightforward than a glass of water. Take a long

look at your next glass full and really appreciate it – what it looks like, what it tastes like, even what it feels like. It’s the healthiest thing you can drink and should be your main beverage choice every day.

### **Next Steps - Weight**

Looking for more in-depth information on weight? Here are some good sources:

National Heart, Lung, and Blood Institute

<http://goo.gl/jkPZ1C>

The Nutrition Source

<http://goo.gl/ZrhaPB>

Choose My Plate

<http://goo.gl/PFjup2>

Nutrition.gov

<http://goo.gl/8HKGUp>

Centers for Disease Control

<http://goo.gl/Bfa1kU>

Obesity Prevention Source

<http://goo.gl/xrNBLz>

## **Be Physically Active**

Exercise is as close to a silver bullet for overall good health as there is, and those benefits certainly extend to breast cancer. Women who are physically active for at least 30 minutes a day have a significantly lower risk of the disease than those who don't. Regular exercise is also one of the best ways to help keep weight in check.

### **Tips and Tricks – Physical Activity**

*Choose activities you enjoy.* When thinking about physical activity, it's easy to conjure up unpleasant images: pained faces at the end of a marathon or grunting athletes at the gym. It's no wonder exercise gets a bad rap. But, in reality, exercise can be really enjoyable. It's just a matter of picking the right activity. Whatever gets you moving at a hard enough effort, counts towards your 30 minutes a day. The talk test is the best way to know if you're going hard enough. If you can talk while you're exercising, but can't sing, that's perfect. And there are a lot of activities that can put you right in that sweet spot - walking, cycling, dancing, playing tennis, even certain types of gardening and housework.

*Make exercise a habit.* There are good habits and bad habits. And if you're like most folks, you have a mix of both. One thing that all types of habits share, though, is power. No matter how busy we get, or how crazy life is, we can almost always fit in our habits day in and day out. Making an effort to turn exercise into a habit can be a powerful tool in the fight against breast cancer and other

serious diseases. So how do you do that? The best way is through consistency. Try going to the gym each day at lunchtime or taking a walk regularly after dinner. You may not always feel like doing it, but by doing it nevertheless, it'll become ingrained into your day. Before you know it, a day won't feel normal if you didn't get in your walk, run, or trip to the gym.

*Stay motivated by exercising with someone.* Friends, family, and workout partners keep you honest. So one of the best ways to make sure you fit in your regular physical activity is to have a standing date to work out together a few days each week. It can be a lunchtime walk, a spin class, or a ballroom dancing class. The most important thing is to set the date and keep it. If you don't, you're likely to hear about it.

*Get a pedometer and shoot for 10,000 steps each day.* If you're looking for a great way to stay motivated, it's hard to go wrong with setting a goal of getting 10,000 steps each day. This has become a standard for a healthy activity level and includes all the steps you take – at work, at home, at the park, at the grocery store. To get started, all you need to do is buy an inexpensive pedometer (good ones start at \$10), put it on at the beginning of each day, and keep moving until it ticks over 10,000. You'll be surprised how that simple little plastic pedometer can keep you on track with your exercise goals.

*Do healthy activities with your kids.* Life with little kids can be exhausting and leave very little time for regular exercise. One of the best ways around this is to do healthy, activities with your kids. Whether it's riding bikes together, going for a run with them in the jog stroller, or just playing tag at the park – the important thing is that you get your exercise, and the kids do, too. Together, you build a fantastic family habit of activity and exercise.

### **Next Steps – Physical Activity**

Looking for more in-depth information on physical activity? Here are some good sources:

National Heart, Lung, and Blood Institute

<http://goo.gl/AMexBS>

ChooseMyPlate.gov

<http://goo.gl/Yv0wMM>

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### **Did You Know?**

*Regular exercise can lower the risk of breast cancer, as well as improve survival in women with breast cancer.*

See:

Simple Steps for Preventing Breast Cancer  
Breast Cancer Survivors

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## **Avoid Too Much Alcohol**

Alcohol can be good for the heart, but when it comes to cancer, there is, unfortunately, nothing really good about it. Even modest amounts increase the risk of breast cancer. In general, if you drink moderately (no more than one drink a day for women) the overall health benefits of drinking outweigh the risks. But if you're particularly concerned about breast cancer, you may want to choose not to drink.

## **Tips and Tricks - Alcohol**

*Choose non-alcoholic beverages at meals and parties.* If you're trying to cut back on alcohol, meals and parties can be tough occasions since so many of them center around alcohol. Yet, more than ever, there are good non-alcohol choices. And if you want to be sure to have a non-alcoholic choice that you like, don't be afraid to bring it along with you.

*Avoid occasions centered around alcohol.* There's no reason to avoid alcohol completely, but if you're trying to cut back to a healthier level and having trouble keeping to the new program, it can be good to avoid occasions or establishments centered around alcohol. Unfortunately, this can mean your favorite watering hole or restaurant, but just keep in mind your bigger goal and maybe you'll miss it a bit less.

*Talk to a health care professional if you feel you have a problem with alcohol.* Alcoholism and problem drinking are major



problems in the United States. By some estimates, close to 20 percent of the population have abused alcohol at some point in their lives <sup>46</sup>. If you feel you have a problem with alcohol – or want to cut back drinking but can't – talk to a health care provider. They can help.

*Discuss the risk and dangers of alcohol use with your children.* It's almost never too early to begin an age-appropriate healthy dialogue with your kids and grandkids about drugs and alcohol use. A health care professional or school counselor can help. For breast cancer, this discussion can be particularly important since alcohol intake in youth and young adulthood can have an important influence on breast cancer risk later in life.

### **Next Steps – Alcohol**

Looking for more in-depth information on alcohol? Here are some good sources:

Centers for Disease Control

<http://goo.gl/zvT5sP>

<http://goo.gl/5uOWHv>

National Library of Medicine

<http://goo.gl/slwCks>

## **Don't Smoke, and Avoid Other People's Smoke, Too**

This really goes without saying. Smokers and non-smokers alike know how bad smoking (and secondhand smoke) is to their health. On top of lowering quality of life and increasing the risk of heart disease, stroke, and at least 15 cancers – including breast cancer – it also causes smelly breath, bad teeth, and wrinkles. Now that's motivation to stay smoke-free or quickly get smoke-free.

Though electronic cigarettes can seem like safe alternatives to standard cigarettes, so much is unknown about their risks and benefits that it's important to avoid them as well. For help quitting smoking, there are many FDA-approved nicotine-replacement options that have been shown to be safe and to double chances of success.

### ***Tips and Tricks – Smoking***

*It's hard to quit, so keep trying.* If there's one thing we all know about quitting smoking, it's that it's hard. It takes most people six or seven tries before they quit for good. So, if at first you don't succeed, try try again. Don't give up. Over a thousand Americans successfully quit smoking every day.

*Talk to a health-care provider.* Seeing a doctor or other health care professional may not be the first thing you think of when thinking about ways to quit smoking, but they can be fabulous

sources of information and cessation aids that can help you kick the habit. Studies show that seeing a doctor for help quitting can double your chances of success.

Visit [smokefree.gov](http://smokefree.gov). Whether you are just thinking about quitting, want help quitting, or are looking for information about quitting for a friend or family member, the federal website [smokefree.gov](http://smokefree.gov) is the place for you. They also host the innovative text message cessation program, [smokefreetxt](http://smokefreetxt), and sites focused on specific groups: [smokefreeVET](http://smokefreeVET), [smokefreewomen](http://smokefreewomen), [smokefreeteen](http://smokefreeteen), and the Spanish-language [smokefreeespanol](http://smokefreeespanol).

Call 1-800-QUIT-NOW. Similar to the federal [smokefree.gov](http://smokefree.gov), 1-800-QUIT-NOW (1-800-784-8669) will connect you to cessation information and resources in your state.

*Talk to your kids about smoking.* If you have kids – or grandkids or nieces and nephews – it’s important to with talk them from a young age about the dangers of tobacco and the need to stay away from cigarettes and other tobacco products.

### **Next Steps – Smoking**

Looking for more in-depth information on smoking? Here are some good sources:

Smokefree.gov

<http://smokefree.gov>

American Cancer Society

<http://goo.gl/glMlZx>

The Truth Campaign

<http://thetruth.com>

### **Breastfeed, If Possible**

Breastfeeding for a total of one year or more (combined for all children) lowers the risk of breast cancer. It also has great health benefits for the child. Unfortunately, as natural a thing as breastfeeding is, it doesn't always naturally fit into today's modern society. While things are certainly better than they were, with more understanding workplaces and day cares, moms still often need to work hard to make it work.

### **Tips and Tricks – Breastfeeding**

*Start early and ask for help.* Breastfeeding has the best chance of success when it's started early, and this usually means beginning an hour or less after the baby is born. Many hospitals help mothers initiate breastfeeding, but it's also best to let the delivery nurses know your desire to breastfeed your baby. If you have questions, ask. If you have problems, ask. Many hospitals offer great support for new moms who want to breastfeed – not only in the hours after birth, but the days, weeks, and months after as well.

*Don't be shy.* Even though there are still a few vocal opponents to breastfeeding in public, put them at the back your mind, and charge forward and breastfeed when and where you need to. Job interviews and board meetings may not be the best venues to do so, but most other places are just fine.

*Coordinate with your workplace and day care provider.* Going back to work is just a fact of life for most new moms, and balancing work and breastfeeding can be a real challenge. A large percentage of new moms are interested in breastfeeding their children, and employers and day cares have taken note, offering much better resources than they used to. If you're unsure about the resources available to you, ask. The human resources office is a good place to start.

### **Next Steps – Breastfeeding**

Looking for more in-depth information on breastfeeding? Here are some good sources:

WomensHealth.gov

<http://goo.gl/aVEIAE>

La Leche League

<http://www.llli.org>

United States Department of Labor

<http://goo.gl/TRSEOD>

National Conference of State Legislatures

<http://goo.gl/y6zNMY>

### **Avoid Birth Control Pills - Particularly After Age 35 or If You Smoke**

There's no denying that birth control pills have been a fantastic innovation – empowering women by putting them in charge of their own reproductive planning. But, like any medication, no matter how great the benefits, there are some risks that go along with them. For standard birth control pills, the most notable side effects are an increased risk of breast cancer, as well as of stroke and heart attack, particularly if a woman smokes and is over age 35 ([more](#)). The good news is that the increase in breast cancer risk is temporary; about 10 years after stopping, risk drops to near that of a woman who has never taken the pill.

Because most women who take birth control pills are young and healthy, the risks linked to their use are usually outweighed in most women's minds by the benefits – which in addition to preventing unwanted pregnancy also include a lower risk of ovarian, uterine, and colon cancer ([more](#)).

For a small group of women, though, who may be at high risk of breast cancer or simply concerned about breast cancer, avoiding birth control pills is one option to lower risk. The best source of

information about the risks and benefits of birth control pills is a health care provider.

### **Tips and Tricks – Birth Control Pills**

*Don't worry too much.* For most women, the risks of birth control pills are outweighed by their benefits. Talk to a health care provider to find out how birth control pills may impact your health.

### **Next Steps – Birth Control Pills**

Looking for more in-depth information on birth control pills? Here are some good sources:

National Cancer Institute

<http://goo.gl/eLLd2>

Susan G. Komen

<http://goo.gl/EoSMvM>

<http://goo.gl/Tkh4TW>

American Congress of Obstetricians and Gynecologists

[http://www.acog.org/For\\_Patients](http://www.acog.org/For_Patients)

Planned Parenthood

<http://www.plannedparenthood.org>

## **Avoid Postmenopausal Hormones**

The issue still comes up in the news, and study results still get parsed and discussed, but in the end, the basic conclusion about postmenopausal hormones remains the same: While they can effectively treat moderate to severe symptoms of menopause, when it comes to breast cancer, it's best to avoid them long term ([more](#)).

If women choose to take postmenopausal hormones to relieve menopausal symptoms (like night sweats, hot flashes, and vaginal dryness), it should be for the shortest period of time possible – not more than 1 – 3 years. And they shouldn't be taken long term with the intent of lowering the risk of chronic diseases like heart disease or osteoporosis ([more](#)).

The best person to talk to about the risks and benefits of postmenopausal hormones is your doctor.

## **Tips and Tricks – Postmenopausal hormones**

*Try to deal with menopausal symptoms without postmenopausal hormones.* Menopausal symptoms are no fun – to put it mildly. And finding relief from them is key. It's best, though, to look past postmenopausal hormones and try to find relief in other ways. Physical activity, for example, can help with mood swings, troubled sleep, and forgetfulness. Identifying triggers (and then avoiding them) can help deal with hot flashes, as can some non-hormonal medications. Over-the-counter lubricants can help with



vaginal dryness. At a certain point, symptoms may be so bad that it makes sense to consider postmenopausal hormones. Talk to your doctor about the best approach.

### **Next Steps – Postmenopausal hormones**

Looking for more in-depth information on postmenopausal hormones? Here is a good source:

WomensHealth.gov

<http://goo.gl/2YL5KE>

### **Find Out Your Family History**

Women with a strong family history of cancer can take special steps to protect themselves, so it's important for women to know their family history of breast and other cancers. You may be at high risk of breast cancer if you have a mother or sister who developed breast or ovarian cancer (especially at an early age) or if you have multiple family members (including males) who developed breast, ovarian and/or prostate cancer. A doctor or genetic counselor can help you understand your family history of the disease.

### **Tips and Tricks – Family History**

*Learn your family history.* Most women will have a general idea of their family history of breast cancer, but it's a good idea to spend a little time to get a more detailed idea of your cancer history,

especially if it's pretty clear that breast or other cancers run in your family.

*Keep things in perspective.* Most women with a family history of breast cancer are not at high risk of the disease. In most instances, family history behaves on par with many other breast cancer risk factors. Of course, women with a very strong family history (multiple family members with cancer or inherited *BRCA1* or *BRCA2* mutations) have a very strong risk of breast cancer. But even these situations don't guarantee a woman will develop the disease.

### **Next Steps – Family History**

Looking for more in-depth information on family history? Here are some good sources:

US Surgeon General

<http://goo.gl/VTT2yU>

Centers for Disease Control and Prevention

<http://goo.gl/c2iNu0>

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**Did You Know?**

*Women with a strong family history of breast cancer have a number of options for managing their risk.*

See: Options for Women at High Risk

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**If High Risk: Consider Risk-Reducing Medications.**

Although not commonly thought of as a “healthy behavior,” taking prescription risk-reducing medications – such as, tamoxifen, raloxifene, and possibly exemestane – can significantly lower the risk of breast cancer in women at high risk of the disease. They can also have important side effects, so they aren’t right for everyone.

“High risk” is specifically defined as a woman with a five-year risk of breast cancer of 1.67 percent or higher, typically calculated by the National Cancer Institute’s [Breast Cancer Risk Assessment Tool](#). If you think you’re at high risk, either after estimating your risk or for some other reason, it’s important to talk to a doctor. Together, you can decide if risk-reducing medication or other steps may be right for you ([more](#)).

**Tips and Tricks – Tamoxifen and Raloxifene**

*Talk to a doctor about your risk and your options.* Many women who feel they’re at high risk are likely not. And some who feel they aren’t, likely are. So it’s important to talk to a doctor or other

qualified health professional about your risk of breast cancer. If you are at high risk, together you can talk about your options for managing that risk and decide which option is likely best for you.

*Review the possible benefits and risks of risk-reducing medication.*

For many high-risk women, tamoxifen, raloxifene, and possibly exemestane are good choices for managing their risk. Though each does have potential side effects, these can be dramatically offset by their ability to cut the risk of breast cancer in half. Talk to a doctor about how these might balance out for you. A huge percentage of women in the United States who stand to benefit greatly from risk-reducing medications choose not to take them – and not always for accurate reasons ([more](#)).

### **Next Steps – Tamoxifen and Raloxifene**

American Cancer Society

<http://goo.gl/dyHRbS>

National Cancer Institute

<http://www.cancer.gov/bcrisktool>

Your Disease Risk

<http://yourdiseaserisk.wustl.edu>

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**Did You Know?**

*The prescription risk-reducing drugs tamoxifen and raloxifene can cut the risk of breast cancer in high risk women by around half or more.*

See: If High Risk: Consider Risk-Reducing Medicaitons

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**For Good Measure**

In addition to the major steps above, there are some other behaviors that you may want to follow just for good measure. While the evidence for these behaviors may not be quite as strong as for the others, or they may not be as readily changed, they can still be important steps for lowering risk.

Try to put these extra behaviors into practice.

**Eat a plant-based diet and consider a multivitamin**

There are a lot of great reasons to eat a diet filled largely with fruits, vegetable, nuts, and whole grains – and a lower risk of breast cancer is likely one of them. If you need inspiration or help moving to a more plant-based diet, visit our friends at [The Nutrition Source](#) at Harvard University. It’s a great place for recipes and other information.

Taking a multivitamin that includes folate is also likely a good nutrition insurance policy, especially for women who drink regularly. Avoid choices that provide “mega-doses.” All you need

is a simple multivitamin that has 100 percent daily value (DV) ingredients – nothing more.

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### **Parents & Grandparents**

*An overall healthy diet in childhood can have an important impact on later adult breast cancer risk. Focus on plant-based foods, like fruits, vegetables, and whole grains. Limit full-fat dairy and meat.*

See: Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life

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### **Be Proactive about Unnecessary CT Scans**

Although they're quick, easy to get, and provide great images, CT scans can increase the risk of breast cancer because they use so much more radiation than more traditional scans, like chest X-rays and mammograms ([more](#)). And they're being ordered more and more simply because of convenience rather than true necessity.

Unless it's an urgent situation where time is critical, start by having a discussion with the doctor when a CT scan first gets ordered – whether it's for you, your child, or other family member. Ask if the test is necessary and if there are other equally good options available. Though no one should avoid a CT scan

solely because of breast cancer concerns, such discussions can help you and your doctor decide how best to move forward.

The [\*Choosing Wisely\*](#) initiative of the ABIM (American Board of Internal Medicine) Foundation can help guide discussions about which tests may be needed for a given medical issue.

### **Try to Avoid Night Shift Work**

There are good data that regularly working the night shift can increase the risk of breast cancer ([more](#)). If you often work at night, changing your schedule to work more during the day could have benefits.

### **Prevention on a Budget**

It's easy to feel that it takes a lot of money to live a healthy lifestyle. *Fresh fruits and vegetables. Fancy olive oil. Gym memberships. Yoga classes.* You can just see the money flying out the door. It's enough to make you ask yourself if it's really worth it. Well the short answer is: Yes, it's worth it – because healthy living really doesn't have to cost much – if any – more than making other choices.

Throughout *Together* we've tried to include less-expensive options for our health tips, but here we'll highlight a few key things that can help keep both you – and your piggy bank – healthy.

*Frozen fruits and vegetables.* Fresh fruits and vegetables are healthy, and can certainly taste really good, but when it comes to healthy eating, frozen options can be just as healthy and cost a whole lot less. Even canned fruits and vegetables can be good. Just be sure to choose low sodium, low sugar/syrup options.

*Farmers' markets.* Farmers' markets are great places to find affordable fresh produce, and small towns to big urban centers host them regularly these days. Keep an eye out, and you'll likely be able to find one close to you.

*Walking.* There's almost nothing more affordable that's better for you than simply walking. You don't need special clothes or a gym membership or an instructor. All you need is a good pair of walking shoes and a good place to walk. And for most people this means just stepping outside. For others it means going someplace to walk, whether it's a school track or gym, a well-travelled area of town, or a shopping mall. For an even better experience, find friends to go with you. A good goal is to shoot for 30 – 60 minutes of brisk walking every day, which, in addition to lowering cancer risk, can strengthen bones and be good for the heart.

*Meatless days.* Meat can be expensive, so one way to save some money and be healthier at the same time, is to try to cut meat out your diet a couple of days a week. Inexpensive alternatives are bean dishes – like rice and beans, or bean burritos.



*Healthier fast food.* The one thing fast food has going for it is the price. You can usually get a lot of food for not much money. And that can be important. But the problem is that most of us automatically choose the less healthy options when we order from a fast food restaurant. And it's often just habit. Next time, take a moment to scan the menu before making your choice because most places now have some tasty, inexpensive, and healthy options. The double cheeseburger meal may be our default, but why not give the bean burrito, grilled chicken sandwich, or spring salad a try?

*Vegetable and Canola oil.* We hear a lot about the wonders of olive oil. How it's so great for us and tastes so good. And those are both true. What's not so great is its price. It's just plain expensive. Well, the good news is that there are a lot of less expensive oils that are just as good for you, and some that may even be healthier than olive oil. Try plain old vegetable oil, corn oil, or canola oil for inexpensive alternatives.

*Affordable mammograms and health coverage.* Getting screened for breast cancer is one of the best things a woman can do to protect her health. It doesn't help prevent the disease, but it can catch it early when it's more treatable. But mammograms can be expensive if you don't have health coverage. Fortunately, with the Affordable Care Act ("Obamacare") now in place – and a number of states also expanding Medicaid coverage for people with low incomes – many more women are able to get health coverage that

includes free screening mammograms. Visit [healthcare.gov](http://healthcare.gov) (phone: 800-318-2596) for more information about coverage. The Centers for Disease Control and Prevention (CDC) also maintains the National Breast and Cervical Cancer Early Detection Program, which offers coverage and other help for women who can't afford breast or cervical cancer screening tests. Contact your state or local health departments to see if you qualify and to get details on the type of assistance they offer.

## **Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life**

Health is a strange thing. It is something that is both very personal and very communal. As individuals, of course, we ultimately have control over the choices we make when it comes to what we eat, how much TV we watch, and how much we exercise. And, of course, if we get sick – or don't get sick – that's about as personal as it gets. It affects only our bodies, and no one else's.

Yet, as we've discussed throughout much of *Together*, good health is also something we can each help others realize. Our surroundings and the people around us can have a profound influence on the health choices we make. This influence is never stronger than in our own homes and within our own families.

Think back to your childhood and how much the habits of your immediate family had on what you ate and the things you did. With early life being a key period in determining later breast health, this means that family can have a large impact on the long-term breast health of the girls and young women in our families.

As with most chronic diseases, it's almost never too early or too late to take steps to lower the risk of breast cancer. But unlike diseases like heart disease or diabetes, age can have an important impact on the steps that actually lower risk.

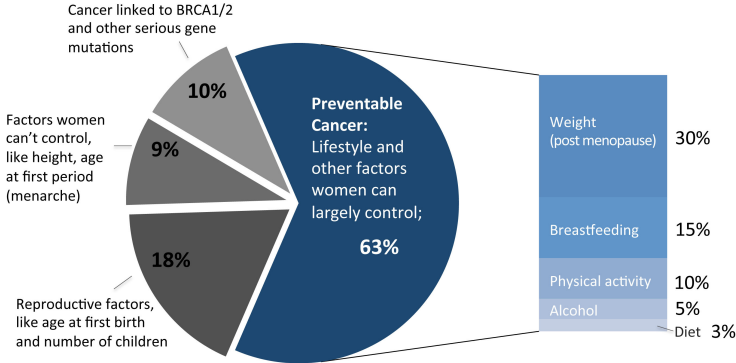
Growing evidence shows that youth and young adulthood is a key time for preventing breast cancer later in life. In fact, between a woman's first period and the time she has her first child, breast cancer risk accumulates quicker than any other time in her life. Growth and development during this period can make breast tissue particularly susceptible to damage, and certain behaviors can have important and lasting impact on risk, both positively and negatively.

Healthy behaviors started in childhood and continued through adulthood could prevent over 60 percent of all breast cancers (see figure). Yet, midlife and later life remain important, particularly because it's a period of time when women become more aware of breast cancer and are often motivated to make healthy changes to lower risk. Even with the later start, half of all

breast cancers could still be prevented with healthy behaviors started at age 50 (see figure).

In this section of *Together*, we build on the nine steps listed in the previous section, tailoring specific breast health tips for various family members and for women based on their stage in life.

**Percent of Breast Cancer Potentially Avoidable if Prevention Begins at Age 2 Years**



### Percent of Breast Cancer Potentially Avoidable if Prevention Begins Between At Age 50 Years or Older

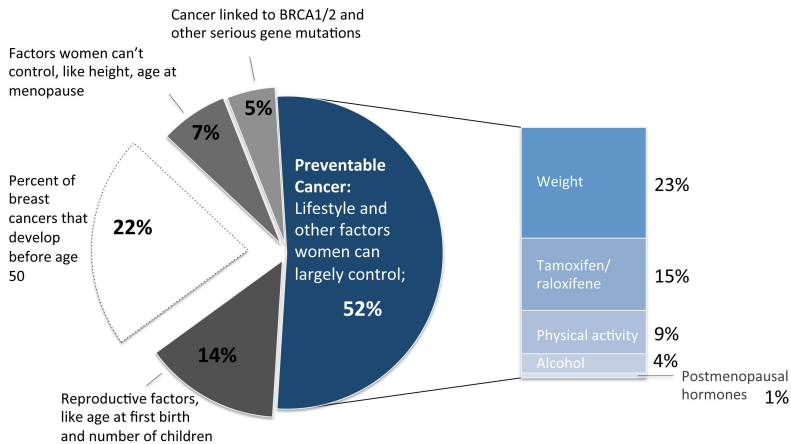


Figure - Percent of breast cancers that could be prevented with healthy lifestyle choices starting as early as 2 years old (previous page) and starting at midlife (this page). Derived from Table 1, Colditz and Bohlke, 2014.

## Mothers

There is little more unique than the relationship between mothers and daughters. It is a relationship that is certainly not always easy, but it is almost always marked by a deep understanding – of the meaning of family, of the issues that surround being female in today’s world, and of the importance of well-being and good health both now and well into the future.

Studies show that the best things mothers can do for daughters when it comes to their long-term breast health is to guide them

toward healthy lifestyle choices both as young girls and then as young women. The earlier healthy behaviors start, the greater impact they'll have on a child's long-term health, and the more likely they are to become behaviors sustained life-long.

These behaviors, which we've talked about before, aren't unique to breast health. Most will also boost heart health and help lower the risk of many other diseases, like diabetes, stroke, colon cancer, and osteoporosis. They're simply great choices across the board, but with added breast health benefits because they can begin at a time in early life when breast tissue is particularly susceptible to harm from certain risk factors.

In addition to guiding your daughter down a healthy path, it's also important as a mother to be good role model and make healthy choices for yourself. As you know very well, if you do it, your children are more likely to do it, too.

### **Young daughters (2 years – 10 years)**

As challenging as the period between the ages of 2 years old and 10 years old can be for a parent, it does offer some sense of control and the ability to steer your children in positive directions.

Within reason, the food you put on the table is the food they will eat and likely come to enjoy – even if it can take some struggling, pouting, and tears along the way, from them, and you. Similarly, if

you're a family that plays at parks and goes for walks throughout the week, that's something that will become ingrained in a child as well and something they'll likely wind up doing throughout their lives and eventually with their own children.

With young daughters, there are three simple things to focus on: healthy activity, healthy food, and healthy weight. Pretty straightforward stuff, but in today's busy world where both parents often work and have very little time to think about such things, they can be much easier said than done.

Luckily, creating a healthy environment for our children isn't very complicated or time-consuming - with a little planning and a little effort.

### **Let little legs move**

We can easily get caught up in all the detailed recommendations we read about physical activity: moderate intensity, vigorous intensity, aerobic fitness, strength, and X-number of minutes a week. And, yes, those can be important, but when it comes to young kids, it's really less about making our kids reach some time targets for activity than it is about simply giving kids the opportunity to be kids. Because being active is really their natural state. Just let those little legs move, and if you happen to want a daily goal to shoot for, it's: a total of 60 minutes, which can be gathered throughout the day in pretty much any way that gets kids moving.

- Be physically active as a family, every day if possible. Go on walks, ride bikes, shoot hoops, dance – whatever gets everyone moving.
- Encourage children to play outside (when it's safe) and to take part in organized activities, including soccer, gymnastics and dancing.
- Walk or ride bikes with your kids to school in the morning.
- Find safe places for children to play when weather is really bad: indoor playgrounds, YMCA, shopping malls.

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### **Parents & Grandparents**

*When it comes to young kids, it's really less about making them hit time targets for activity than it is about simply giving kids the opportunity to be kids. Being active is really their natural state.*

See: Breast Health Tips for Mothers, Grandmothers, Daughters, Cancer Survivors, and Women at Every Stage of Life

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### **Freeze the screens**

Children grow up as digital natives these days, but that doesn't mean that all that screen time doesn't have health repercussions. Too much screen time takes time away from physical activity and can promote unhealthy eating.



- Limit TV, tablet, computer, and other screen time to under two hours a day. The less, the better.
- Keep TV, tablets, and smartphones out of children’s bedrooms.
- Choose one day each week to go TV-free and tablet-free as a family. Board games and family cooking clubs are great screen-time alternatives.

### **Offer a lot of plant foods**

When it comes to promoting breast health later in life, getting daughters to eat a lot of plant-based foods early in life is important. This means focusing on fruits, vegetables, nuts, and whole grains, and eating less full-fat dairy and meat.

- Make fruits and vegetables a part of every meal. Put fruit on cereal. Cut up vegetables as a snack.
- Dice vegetables into soups, sauces, even batters. It’s an easy – and tricky - way to add more vegetables to meals.
- Keep fruit out where kids can see it: on the counter, on a desk, in a backpack. If they can see it, they’re more likely to eat it.
- Offer whole-grain cereal, brown rice and whole-wheat bread over refined choices, like white rice and white bread.
- Try a meat-free week. The family just might like it.
- Make dishes made with olive or canola oil, which are high in healthy fats.

- Cut back on full-fat dairy, fast food, and store-bought snacks (like cookies), which are often high in unhealthy fats.

### **Don't obsess but keep track of weight**

Weight is clearly a loaded issue, especially for girls. And it's important not to create or perpetuate in your daughters – or any girls for that matter – unhealthy body image. In today's world of photo-shopped models and selfies, females of all ages have a hard enough time comparing themselves to unreal expectations of beauty and body size.

At the same time, however, it's important for parents to be aware of their daughter's weight and to know whether it may be too low, too high, or in the normal range. Surprisingly, studies show that many parents have trouble knowing if their child is an unhealthy weight or not. So, simply knowing can be a victory in itself.

A good place to start if you have questions about your child's weight is the [CDC's BMI Calculator for Child and Teen](#). This tool uses a special calculation of weight, height, gender, and age to estimate whether a child is underweight, normal weight, overweight, or obese. Because children are still growing and developing, these labels are not always perfectly accurate, so it's important to bring up any concerns about your child's weight directly with a healthcare provider.

- Keep track of your child’s weight and bring up any concerns with a health care provider.
- Help your daughter focus on healthy food choices and healthy activities rather than on weight and body image.
- Give your children the chance to be physically active every day.
- Limit sweets and processed foods, which are often high in calories as well as carbohydrates that can stimulate hunger.
- Limit TV, tablet, computer, and other screen time to under two hours a day. The less, the better.
- Help your children get enough sleep by setting a bed time and sticking to it every day. Keeping electronics out of the bedroom also helps.

### **Begin the conversation about smoking**

It’s almost never too early to start to talk with kids about the importance of never smoking. Though there isn’t as much youth exposure to smoking imagery as there used to be a decade ago, there’s still plenty out there for kids to see – on TV, in magazine ads, and at sporting events. And even if they don’t voice them out loud, kids will begin early on to have questions about cigarettes and smoking. So even if this age group may be a bit too young to actually begin to experiment with smoking, it’s still an important time to help them form healthy attitudes about tobacco use that can help them avoid smoking when they’re older.

- When teachable moments come up – such as seeing someone smoking on TV – talk with kids in general terms about the health risks of smoking.
- Keep your house – and yourself – smoke-free. One of the best things you can do as a parent is to lead by example.

### **Older daughters (11 years – 17 years)**

In the tween and teen years, children begin to fully explore their independence, and this translates to many of their health choices. While parents may slowly lose some of the direct influence they have on their daughters' choices, family life remains a very strong influence on the choices girls make and the lasting habits they'll form.

Most of the breast health messages that apply to [younger daughters](#) apply to this age group as well. What varies slightly is the approach. It can be important in this older group to treat daughters as more independent beings who have a certain degree of control over their choices. They are little adults, or at least they think of themselves that way. And along this vein, it is also a period of time where more adult issues come into play, like alcohol.

To foster **regular physical activity** in older daughters, follow the [younger daughter activity tips](#) and [screen time tips](#). You should also encourage daughters to take part in school and club sports or explore other activities, like running, hiking, and dance,

independently. If they have good experience in a particular sport, they're old enough now to also think about helping coach younger teams or activity clubs. Becoming advocates for healthy activity can also help build a lifelong love of exercise. Girls can lobby for more physical education at schools or the creation of more activity-based afterschool clubs.

Similarly, in addition to following the [younger daughter healthy food tips](#), you should encourage your older daughters to explore **healthy food choices** independently of what the family offers at meals. They can search for healthy recipes online and at libraries and cook healthy meals for themselves as well as the family. Rating recipes and sharing these with their peers can provide added motivation. If you have sons in the house, you can also have them do the same. The key is getting everyone in the family actively engaged in healthy eating.

Body image can be an issue at any stage in life, but as girls enter middle school and high school, it can become something that feels supercharged. Just as with younger children, it's important to be aware of any weight issues your older daughter may have but to have the focus be on healthy eating and activity habits rather than directly on weight. In addition to [tips for younger daughters](#), it can be instructive for older girls to build some media literacy around body image – to be able to think about the portrayal of female beauty that magazines, websites, and social media help perpetuate. By helping your daughters become aware that what

they often see on screen is not real life, they can develop a healthy approach to body image that will help keep them healthy and active throughout life.

## **Alcohol**

As children get older, the issue of alcohol will almost inevitably rear its head to some degree. And unfortunately, drinking in youth and young adulthood may be particularly bad when it comes to breast cancer risk later in life ([more](#)).

While it's virtually impossible as a parent to keep a strong-willed teenage daughter from drinking if she really wants to, it's important for parents to have open discussions with their children about drinking and the associated risks, including the impact on breast health.

- Have open discussions about alcohol as a family, including the short and long-term risks of drinking. A health care professional or school counselor can help if needed
- Avoid making alcohol an essential part of family gatherings.
- Encourage media literacy discussion around alcohol ads on TV and in magazines. Ask them questions, like: What are these ads saying? What do they want you to do? How do these ads mesh with reality?

## **Smoking**

This age group is prime for experimentation. Unfortunately, when it comes to cigarettes, experimentation can have lifelong consequences. Around 90 percent of adults who regularly smoke tried their first cigarette before age 18. So, it's important to have open discussions with your daughters very early in life about the dangers of smoking, how addictive cigarettes and nicotine are, and how hard it can be to stop smoking once started.

Though in a tween and teen's mind there can be a big draw to smoking – it can make them feel more mature and part of a group – there's a lot going against it, too - even within the short time horizon that youth live in. It's expensive, and it makes clothes and breath smell. And even some of the longer-term risks can be compelling, such as wrinkles, bad teeth, and an increased risk of many serious diseases, including breast cancer.

Electronic cigarettes are also important to be aware of in these ages. Statistics show that kids are using them more and more, and though electronic cigarettes are often marketed as safe alternatives to standard cigarettes, there are a lot of possible dangers for youth who use them – from nicotine addiction to exposure to risky chemicals to a greater likelihood of taking up regular cigarettes.

As with other issues, a little media literacy can go a long way to dissuade children from falling for the allure of tobacco and electronic cigarettes. The older children get, the more they like to

feel in control and independent. Helping them understand how tobacco companies try to manipulate them by constructing appealing images of tobacco in advertisements, TV shows, concerts, and movies can help them more easily resist smoking's draw. [The Truth](#) campaign by the American Legacy Foundation is a great source of information for parents and kids about Big Tobacco's "lies and manipulation."

As a parent, one of the best things you can do is to lead by example and maintain a smoke-free house and be smoke-free yourself.

A great source of information for parents and teens is [smokefree.gov](http://smokefree.gov), a federal site, which also includes [smokefreewomen](#) and [smokefreeteen](#).

### **Adult daughters (18 years and older)**

As much as some of our daughters might prefer it, our parenting doesn't magically stop when they become adults. Although our outsized influence may be a bit diminished, we can still be trusted guides, helping our daughters navigate through their next stages of life, whether it's college, marriage, or childbirth. And no matter how old or how young our daughters are, healthy choices remain an important part of their lifelong breast health and overall well-being.



Continuing to show an interest in their health and helping them make the healthiest choices possible are important in your continuing role as a mother. This can be as simple as asking whether your daughter's recently had a clinical breast exam or setting up a time to go for a walk with her each week. Every little thing can add up over time.

And, really, the key things mothers can help their young adult daughters focus on are not that different than those for younger girls: plant-based foods, exercise, weight, and alcohol ([detailed list and tips](#)). It's really just the context that's different.

## **Grandmothers**

It's pretty great to be a grandmother. You get to play a role in your grandchildren's development and accomplishments but usually have much less responsibility for day-to-day care. It's really the best of both worlds – a lot of the fun parts of parenting with many fewer of the exhausting parts.

Though grandparents often have a less direct influence than parents, they can still have a major impact on their grandchildren's lives. Most of us lucky enough to know our grandparents can likely single out at least one whose life experience, or attitude, or general character had an important role in who we've become. Likewise, you too can have a positive influence on your grandchildren. More specific to this book, you

can help guide your granddaughters in making good breast health choices that will have lifelong benefits for them.

Of course, the level and type of influence you can have can vary from situation to situation. If you live far away from your granddaughters, you will likely have fewer opportunities to have an impact than if you live close by and see them every week. But don't underestimate the power of grandmothers. Even in small doses they can have a big influence. And in today's world of Skype, social media, and smartphones, proximity is not as important as it once was.

Whether it's in person or over the Internet, most of the same breast health recommendations and tips for mothers and daughters apply to grandmothers and granddaughters. See which ones work for you and the type of relationship you have with your granddaughter(s): [young daughters \(2 years – 10 years\)](#), [older daughters \(11 years – 17 years\)](#), and [adult daughters \(18 years and older\)](#).

### **Women: 18 – 29 years old**

You're a full-fledged adult – may have been for many years – and more than any other time, you have the power to set the stage for your lifelong breast health. By some estimates, healthy changes started now and continued on throughout life can prevent over half of all breast cancers.

Of course, who wants to think about healthy living when you're already young and healthy? But, really, there's no better time. Healthy behaviors now can keep you fit, energized, and feeling good mentally and physically. And the benefits only grow from here on out as you get older and breast health becomes even more important.

Most of the [general steps for preventing breast cancer](#) apply to women in this age group. But, here, we tweaked them a bit for more relevance to younger women.

### **Go big with plant-based foods - fruits, vegetables, nuts, and whole grains.**

It doesn't really matter exactly how you practice it - vegan, vegetarian, Mediterranean, whatever - what's important is eating a varied diet that's low in meat, low in full-fat dairy, and high in plant-foods. Growing data show that a diet rich in plant-fiber, nuts, and possibly soy is important for early-life breast health.

- *Try a new cookbook - or three.* There are more cookbooks than ever, catering to any and all ways of eating. Online, in stores, or at the library explore some plant-based titles and see which pique your interest.

### **Think before you drink.**

Hey. We get it. Drinking can be alluring when you're young. And it's wrapped up in so many activities that it can be hard to avoid

even if you want to. But there's a lot of serious baggage that can tag along with all the fun that gets linked with drinking. And we're not just talking hangovers, but violence, accidents, and risky sex. Adding insult to injury, regular drinking when you're young also ups the risk of breast cancer – a risk that doesn't go away over time. When you're young, the breasts grow and develop so quickly that they're quite vulnerable to damage from alcohol. Avoiding it completely is your best bet, especially if you're under 21. If you do drink, do it only occasionally, and for many reasons, don't over-do it.

- *BYOS – Bring Your Own Soda, or other non-alcoholic drink.* Depending on the crowd you run with, it can difficult to find enjoyable non-alcoholic drinks at dinners or parties. So, why not come armed with your favorite soda or other non-alcoholic drink? Don't be shy. Wear it as a badge of honor. There could be some teasing involved, but more likely, a lot of people will be simply be envious.

### **Put on Those Dancing – and Walking and Running and Cycling – Shoes**

It almost doesn't matter what you do as long as you get out there and get your body moving every day. Picking a physical activity you enjoy will mean you're more likely to keep it up – not only now but throughout life. Shoot for 30 minutes a day of whatever you choose. More is even better, and any amount is better than none.

- *Find a friend.* You already love to trade jokes, gripes, and a bit of gossip with friends, so why not do it while you're at the gym, on a run, or riding your bike? Making a date to work out is one of the best ways to make sure you fit it in, and when it's couched in a great tete-a-tete you'll have even more of a reason to lace up your shoes and get out the door.

### **Don't Obsess – But Watch Your Weight**

OK. This is nothing new. Developing a healthy approach to weight is key to living a healthy life and boosting your lifelong breast health. Admittedly, developing that healthy approach can be tough in the era of cheap fast food, social media, and selfies. But you don't need to look like a marathon runner or runway model to be healthy - far from it, in fact. A woman who is 5' 5" can weigh between 111 and 150 pounds and fall into the healthy range. For many young women, this is very doable. And laying down a foundation of healthy eating and exercise makes it that much easier to maintain this healthy weight moving through adulthood, and that's what's really key when it comes to breast health and overall good health.

- *Hop on the scale – every day.* Yes. This can seem like an obsessive way to relate to your weight. But weighing yourself regularly has been shown to be one of the best ways to keep weight in check. Big weight gain often sneaks

up on people. This can then lead to big diets or huge bursts of exercise, which can be hard to keep up long term. Hopping on the scale every day can give you a good sense of daily fluctuations in weight and can help you make smaller, sustainable adjustments to what you eat or how active you are. Counterintuitive. Maybe. But give it a try and see how it works.

### **Stay Smoke-Free, or Get Smoke-Free**

Cue the broken record, right? Smoking is bad for you. But, be careful not to downplay smoking just because you already know the messages about it. Smoking isn't just bad, it's *the* bad thing for your overall health. No other choice you can make has as much of an impact on your risk of cancer and other serious diseases – not to mention your risk of bad breath, bad teeth, and smelly clothes. So, the best thing you can do is stay smoke-free or, if you smoke, get smoke-free as soon as possible.

Although electronic cigarettes are often marketed as safe alternatives to standard cigarettes, so much is unknown about their risks and benefits that it's important to avoid them as well. For help quitting smoking, there are many FDA-approved nicotine-replacement options that have been shown to be safe and to double chances of success.

- Visit *The Truth*. The long-running *The Truth* campaign – [www.thetruth.com](http://www.thetruth.com) – uses facts to take down the distorted

messages of Big Tobacco. It's a great resource for smokers and non-smokers alike that want to make a difference.

- Visit [smokefree.gov](http://smokefree.gov). Quitting smoking is tough, but now more than ever there are great options for smokers who want to quit or are just looking for more information about quitting. [Smokefree.gov](http://Smokefree.gov) collects all this information in one place and connects smokers with resources that can double their chances of quitting for good. It's also the home of the innovative – and free – text message cessation program [Smokefree TXT](#).

### **Women: 30 – 49 years old**

You're really reaching your stride in life, and these years between 30 – 49 are very important when it comes to breast cancer risk. It is a time when women become more aware of the disease and are more motivated to take steps to prevent it.

As with younger adults, most of the [general steps for preventing breast cancer](#) apply to women in this age group – but with a few tweaks.

- [Be physically active](#)
- [Avoid too much alcohol](#)
- [Keep weight in check](#)

- [Avoid birth control pills](#) - particularly after age 35 or if you smoke
- [Don't smoke](#)
- [Breastfeed, if possible](#)
- [If high risk: consider tamoxifen](#)
- [Help your daughters make healthy choices](#)
- Early life plays an important role in breast cancer risk later in life, so helping your daughters develop lasting healthy habits early is one very important gift you can give them. For breast health, the focus should be on being active, eating a healthy plant-based diet, keeping weight in check, and avoiding alcohol.

### **Women: 50 Years Old and Over**

You may have crossed over into midlife – or even beyond – but it's never too late to start making healthy changes that can lower your breast cancer risk. A large percentage of breast cancers in this stage of life could be avoided by things women can do.

As with other ages, most of the [general steps for preventing breast cancer](#) apply to women in this age group – but with a few tweaks.

- [Be physically active](#)
- [Avoid too much alcohol](#)
- [Keep weight in check](#)



- [Don't smoke](#)
- [Avoid postmenopausal hormones](#)
- [If high risk: consider tamoxifen or raloxifene](#)
- Help your [daughters](#) and [granddaughters](#) make healthy choices
- Early life plays an important role in breast cancer risk later in life, so helping your daughters and granddaughters develop lasting healthy habits early is one very important gift you can give them. For breast health, the focus should be on being active, eating a healthy plant-based diet, keeping weight in check, and avoiding alcohol.

## **Breast Cancer Survivors**

As a survivor, you know how hard breast cancer is. Diagnosis and treatment can be frightening and draining, and even after you've made it past those hurdles, you have to learn how to make your way through life as a cancer survivor.

With modern medicine, though, more and more women are living long and fulfilling lives as survivors. The 5-year survival for stage I breast cancer is very close to 100 percent, and there are three million women in the United States who either are going through treatment or have finished treatment for the disease.

These eight key steps can lay the foundation for the many health-filled years that most survivors enjoy. You'll notice some

similarities with the [general steps for preventing breast cancer](#), but there are some key differences unique to being a survivor.

It's almost never too early to start down the health path as a survivor. Whether you've just been diagnosed, are going through treatment or are post-treatment, these behaviors can help boost your health.

Your doctor can help guide you, but the only limitation, really, is when you want to start. Begin with one or two; once you've got those down, move on to the others.

### **Don't Smoke**

You've heard it before, of course. But, if you smoke, the single best thing you can do as a survivor is stop. It will lower your risk of developing a second cancer as well as heart disease and stroke. Yes, it's hard. But it's far from impossible.

- Keep trying! It often takes six or seven tries before you quit for good.
- Talk to a health care provider. It can double your chances of success.
- Call 1-800-QUITNOW (1-800-784-8669) or visit [smokefree.gov](http://smokefree.gov) for extra help.
- Join a quit-smoking program. Your workplace or health plan may offer one.

## **Avoid Secondhand Smoke**

If you don't smoke – and even if you do – stay away from secondhand smoke. It's not as bad as smoking yourself, but spending time in smoky places can further raise the risk of cancer as well as heart disease.

- Avoid smoky bars and restaurants.
- Try to work in a nonsmoking workplace.
- Make your house nonsmoking and don't give in, not to spouses, kids or friends.

## **Exercise Regularly**

It's tough for a lot of people to fit exercise in to their schedules. For survivors whose regular routines have been so interrupted and who may have just gone through treatment, it can be even tougher. But the benefits of regular activity make it well worth the effort to fit it in, even for those in the middle of treatment. It not only boosts health but also improves mood and helps counter cancer-related fatigue. Regular exercise may lower the risk of recurrence and help cut the risk of other chronic diseases.

Try to get at least 30 minutes of aerobic activity (like brisk walking) every day. More is even better. It's also important to fit in strength training. Build up to two or more times per week.

- Choose activities you enjoy. Many things count as exercise, like walking, gardening and dancing.

- Make exercise a habit by setting aside the same time for it each day – try going to the gym each day at lunchtime or taking a walk regularly after dinner.
- Stay motivated by exercising with someone.

## **Maintain a Healthy Weight**

With the stress, treatment side effects, and changes to life's routine that a cancer diagnosis can bring, it can be hard for survivors to keep weight in check. Still, maintaining a healthy weight — or at a minimum, not gaining weight — is an important goal that all survivors should shoot for. Next to not smoking, it's the single most important thing you can do to improve your health and quality of life.

- Limit time in front of the TV and computer.
- Integrate physical activity and movement into your life.
- Eat a diet rich in fruits, vegetables and whole grains.
- Choose smaller portions and eat more slowly.

## **Eat a Healthy Diet**

As a survivor, it can be tough to know how you should eat. Books and articles and websites spout "wonder" diets, but the reality is that healthy eating is the same for cancer survivors as it is for everyone else. A healthy diet can help keep weight in check, and give your body the nutrients and energy you need to make it through a busy day.

You should focus on fruits, vegetables and whole grains and keep red meat to a minimum. It's also important to cut back on bad fats (saturated and trans fat) and choose healthy fats (polyunsaturated and monounsaturated fats) more often. Taking a 100 percent Daily Value (DV) multivitamin with folate every day is a great nutrition insurance policy.

- Make fruits and vegetables a part of every meal.
- Put fruit on your cereal. Eat vegetables as a snack.
- Choose chicken, fish or beans instead of red meat.
- Choose whole-grain cereal, brown rice and whole-wheat bread over their more refined counterparts.
- Choose dishes made with olive or canola oil, which are high in healthy fats.
- Cut back on fast food and store-bought snacks (like cookies), which are high in bad fats.
- Follow food safety steps to avoid food poisoning.

### **Drink Alcohol in Moderation, If at All**

Alcohol can be a complicated issue, especially for survivors. Moderate consumption can be heart healthy – a big benefit. But at the same time, it can increase the risk of a later cancer. On top of this, alcohol can become for some an unhealthy way to deal with the physical and emotional stress of cancer.

If you don't drink, don't feel the need to start. If you do, keep it to moderate levels (one drink a day for women, one to two drinks a day for men). Those who drink more should cut back.

- Choose nonalcoholic beverages at meals and parties.
- Avoid occasions centered around alcohol.
- Talk to a health care professional if you feel you have a problem with alcohol.

### **Stay Connected With Friends, Family, and Other Survivors**

There is real power in staying connected with friends, family and other cancer survivors. Keeping up and building on a social network can significantly improve quality of life – and possibly even prognosis – in cancer survivors. Even for those with great support from family and friends, cancer can seem isolating, so it can take some effort to keep up these relationships.

- Schedule a time each week to get together with friends or family.
- Go regularly to survivors’ support groups, which can be great places to share feelings and concerns with those who’ve been through similar things.
- Use technology to your advantage. Social media, real-time video, and good old-fashioned telephones and email are great ways to connect with family, friends, and other survivors.

### **Get Screening Tests and Go to Your Regular Check-Ups**

As a survivor, there’s nothing more important than going to your regular post-treatment check-ups with your primary care doctor

and oncology team. These visits are not only key to your health as a survivor but also great places to share any concerns or questions you have about your health. Become a team with your doctors to manage your health needs. In addition to any follow up tests specific to breast cancer, it's also important to keep getting recommended screening tests for other cancers and for heart disease, diabetes, and osteoporosis risk factors.

### **Talk to your doctor about tests that screen for:**

- Colon cancer
- Cervical cancer
- Lung cancer (if history of smoking)
- Hepatitis C (if born 1945-65)
- High blood sugar
- High blood pressure
- Unhealthy blood cholesterol
- Bone loss

## **Finding Cancer Early – Screening Tests**

If asked to name one thing that helps protect against breast cancer, most women would answer: get a mammogram. And, they'd be right. Although screening tests like mammograms don't help prevent breast cancer, they do save lives by catching cancer early when it's most treatable. With the advent of better screening and better treatment, the survival rates for breast cancer have increased drastically over the past 30 years. Between

1975 and 2006, the percent of women with breast cancer surviving for at least five years increased from 75 percent to just over 90 percent

For most women, screening typically begins in the 20's with clinical breast exams every three years through the 30's. Clinical breast exams are done by a health care professional (such as a doctor or nurse) and involve using the fingertips to feel (palpate) the breast for any abnormal lumps or tissue.

At age 40 and older, clinical breast exams are typically recommended every year along with a mammogram every one or two years. Mammograms are special X-rays of the breast that can find small growths or other abnormalities that are hard to find by feel.

Women at increased risk of breast cancer ([more](#)) may have tests done more often or may be screened regularly by magnetic resonance imaging (MRI).

Anything unusual found by screening needs to be followed up. Sometimes this is simply waiting and having the doctor re-check it at a later time to see if the issue resolves on its own. Often, though, follow-up tests are required. Though the specific tests can vary depending on the situation, the first tests ordered are usually non-invasive scans like an ultrasound or MRI scan. These can provide a very detailed image of the suspicious area of the



breast. Based on these test results, cancer can often be ruled out. If there's still some doubt about things, more involved follow-up is needed, usually a needle biopsy, which uses a thin hollow needle to remove a small sample of tissue that is then examined under a microscope to confirm or rule out cancer.

If a biopsy finds cancer, treatment planning begins.

### **Is there a mammography controversy?**

No health screening test is perfect, and mammograms are no exception. Along with their benefits, they can also have some risks. Deciding exactly how these risks and benefits balance against each other has been an active area of debate in scientific circles.

While studies show that regular breast cancer screening can lower the risk of dying of breast cancer by an average of around 20 percent, these same studies show that many women also experience unnecessary follow-up tests, and even unnecessary treatments, due to screening.

Data show that over a 10-year span, 40 – 60 percent of women who get a mammogram every year can expect to have at least one abnormal result that needs some sort of follow-up exam<sup>47</sup>. This means that of 10 of your female friends who've had annual mammograms for a decade, about four to six of them will have had some kind of a scare that needed follow up.

Of course, the large majority of these follow-up exams will not find cancer, and that's certainly good. But, there's a downside to it as well. It means that a high percentage of women screened with mammography *and who did not have cancer* have had to endure the anxiety and risks associated with an abnormal mammogram and extra follow-up exams. In the medical field, such false alarms are called "false-positives." And while false-positives are inherent in any screening test – mammograms tend to have a fairly high rate, especially when they're used to screen younger women.

False-positives, though, aren't the only issue with mammography, there is also something called "overtreatment." This occurs when a mammogram and subsequent follow-up tests find cancer, but it's a cancer that would never have become a health issue if left alone and undetected. This can seem counterintuitive to what most of us know about cancer. But some cancers are so slow growing or unaggressive that they would never actually pose a threat. This means some small number of breast cancers are being diagnosed and then treated with surgery, radiation, and/or chemotherapy for no real reason.

To put all this in context, let's look at some numbers from a paper in the journal *JAMA Internal Medicine*:<sup>48</sup>

If a thousand 40 year-old-women are screened with mammography annually for ten years	
Up to 2	would avoid death from breast cancer caught by mammogram
510 – 690	would have a false-positive mammogram
60 – 80	would have a biopsy because of a false-positive mammogram
Up to 11	would experience overtreatment

If a thousand 60 year-old-women are screened with mammography annually for ten years	
1 - 5	would avoid death from breast cancer caught by mammogram
390 – 540	would have a false-positive mammogram
50 – 70	would have a biopsy because of a false-positive mammogram
6 - 20	would experience overtreatment

Adapted from Welch & Passow, 2014

These numbers really show the complexity of the issue and why there is an ongoing discussion in the media and certain scientific circles about the balance of risks and benefits of annual mammograms. Mammograms have been found to save lives, but at the same time, they can lead to false-positives and overtreatment – each of which brings significant anxiety as well as health risks.

The interpretation of these trade-offs has led some researchers and organizations to recommend against routine screening with mammograms, especially for women in their 40's.

Yet, looking at these same data, the American Cancer Society still recommends annual mammography screening for women age 40 and over. The United States Preventive Services Task Force recommends mammography every other year for women age 50 – 74, leaving screening for women under age 50 an individual decision.

We think that mammography remains an important screening tool. It's understandable, though, for some women to have questions about mammography's balance of risk and benefits, and these should be shared in an in-depth discussion with their doctors. Together, they can decide the best approach to breast cancer screening.

### **What about breast self-exam?**

Almost all women at some point have either read somewhere or been told that it's important to do breast self-exams. Yet, the strange thing is, there really is no good evidence that self-exams actually do women any good. This can seem counterintuitive. Nearly everyone has a compelling story of a friend or relative who found a lump or a cancer by examining her own breasts. But when all the studies of breast self-exam are looked at together, it hasn't been found to be an effective screening tool. It doesn't lower the death rate from breast cancer, and it can actually increase the rate of unnecessary and risky procedures, like biopsy.

The American Cancer Society states that breast self-exam is an option for women who want to do them, but that it's also important to talk to a physician about the potential benefits and limitations of breast self-exam. Any lumps or changes in the breast should be reported to a doctor immediately. If a woman chooses to do self-exams it should never be instead of clinical breast exams or mammograms.

## **Community Action to Prevent Breast Cancer**

There's a lot of pressure placed on individuals when it comes to health. And there's no doubt that each of us is ultimately responsible for the health choices we make. We're the ones who lace up our shoes and head out for a walk, and we're the ones who choose the apple instead of the doughnut. But, such a primary focus on the individual denies something most of us inherently understand and that we've discussed already: that making such personal choices is influenced by much more than our will power. The people and places that surround us have a profound impact on how we act, and even on the options that are available for us to act on.

How can we exercise regularly when there are no sidewalks or affordable gyms in our neighborhoods? How can we eat a healthy diet when our friends and family only want to eat fast food?

So it follows that in addition to looking after our own health and the health of our families, taking some steps to help improve the health of our communities can have important pay-offs as well – for everyone.

Just like a lot of the individual steps you take to lower breast cancer risk, some pretty modest community-oriented changes can have a big impact, if just because they become part of a larger movement to improve community and neighborhood health. Of course, you can get as involved as you want. There are major opportunities in every single community no matter how big or small, or how high-income or low-income.

One way to get started is to look over the list of ideas we have here. Then, if you feel inspired, take things from there.

## **Physical Activity in Your Community**

### **Support Physical Activity Programs in Your Local Schools.**

Healthy habits, including physical activity, start early in life. By getting involved in your local schools or afterschool programs, you can help children to become active – and stay active – throughout life.

- Encourage your local schools to develop new policies promoting physical activity.

- Volunteer with an afterschool program that offers physical activity programs – or start one in your community.
- Get together with your neighbors to create a walk-to-school program for local children.

**Talk to Supervisors or Human Resources Managers about Physical Activity Programs in the Workplace.** Employers can play an important role in making physical activity a part of daily life.

- Request shower and locker room access for employees who walk or ride their bikes to work, or who workout at lunch.
- Ask about free or discounted employee gym memberships
- Start an employee walking club.

**Advocate for Safe and Convenient Walking Paths and Bike Routes.** Despite their best intentions, people often give up on walking or cycling around town because they simply face too many obstacles, with busy intersections, inattentive drivers, and poorly lit sidewalks being just a few. You can help make your community more pedestrian- and bike-friendly.

- Join or start a coalition dedicated to enhancing the walkability of your town or neighborhood.
- Work with your local government to improve existing conditions for pedestrians and bicyclists.

- Contact your elected officials to express your support for safe and healthy transportation options in your area.

## **Healthy Eating in Your Community**

### **Talk to Supervisors or Human Resources Managers about Food Choices and Nutrition Programs in the Workplace.**

Employers can play an important role in promoting healthy eating.

- Request that your workplace offer healthy food choices not only in their cafeterias and vending machines but also during meetings and conferences.
- Ask about offering educational seminars on healthy cooking.
- Request that your workplace host a weekly or monthly farmers market.
- 

**Support or Start a Community Garden or Farmers Market in Your Area.** Community gardens and farmers' markets can help ensure that fresh produce is available and affordable in your community.

- Encourage local schools to add a sustainable and hands-on gardening unit to their curricula.



- Talk to city officials about creating a community garden space.
- Establish a farmers market in your area.

**Encourage Local Retailers and Restaurants to Offer Healthy Food.** Whether or not people eat a healthy diet will depend in part on whether healthy food is available to them.

- Urge local supermarkets, convenience stores, and restaurants to offer nutritious food.
- Talk to local agriculture groups about bringing farmers' markets to areas that may not have food stores with many healthy options.

## **Alcohol in Your Community**

**Support Programs and Policies to Reduce Underage Drinking in Schools and Colleges.** Because many young people spend substantial time in school or on college campuses, these institutions play an important role in reducing underage drinking.

- Encourage high school administrators to offer peer support programs.
- Encourage college administrators to offer alcohol-free dorms and alcohol-free events.
- Talk to city officials about better enforcement of laws restricting sales of alcohol to those under 21 years old.

**Join or Create a Coalition to Reduce Alcohol Use in Your Community.** Community coalitions can play an important role in helping people of all ages limit their alcohol use. Such coalitions can promote alcohol-free events. Send letters to legislators or local businesses, or testify before town councils.

### **Community Action Resources**

Let's Move

<http://www.letsmove.gov/action>

National Healthy Worksite Program

<http://www.cdc.gov/nationalhealthysite/join/resources.html>

Farmers Market Coalition

<http://farmersmarketcoalition.org>

Mothers Against Drunk Driving

<http://www.madd.org>

## **New Patterns in a Changing World**

In the early days of breast cancer research, one statistic made the compelling point that the disease could be preventable: the large variation in rates of breast cancer across the globe. Though such variation could be due in part to genetics and environmental factors, the differences in rates were so large that it pointed to other, more malleable factors – like nutrition, weight, and reproductive characteristics.

Those hypotheses from the early days have largely been borne out over the years, and variations in rates of breast cancer still persist between countries. Developed areas, like Scandinavia, Europe, and the United States, have much higher rates of the disease than developing areas (see figure). This is largely tied to developed countries having plentiful and inexpensive food, a higher percentage of sedentary jobs and obesity, and families that often delay childbirth and have fewer children.

Rates of annual new breast cancer cases is around 72 per 100,000 people in more developed countries and just under 30 per 100,000 in less developed countries <sup>6</sup>. The rate in North America is close to 84 per 100,000. In East Africa it's 21 per 100,000.

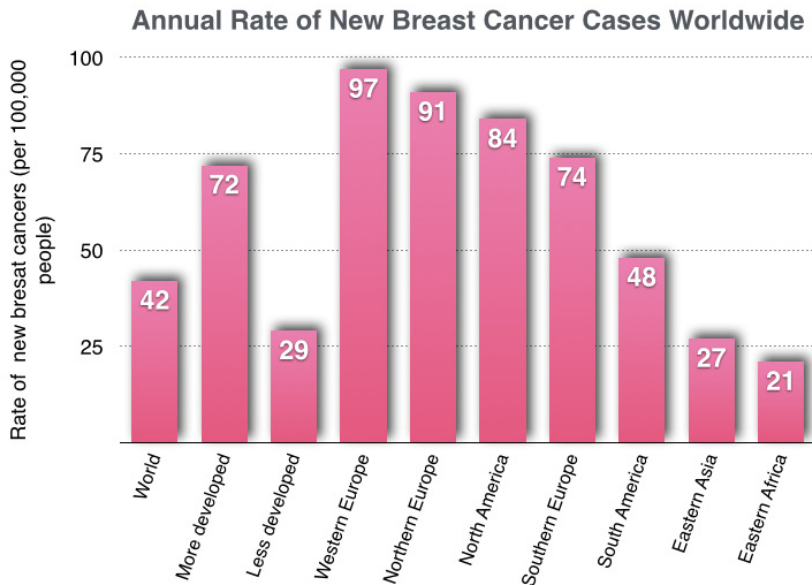


Figure - Annual rate of new breast cancer cases worldwide. Source: Youlden, et al, 2012.

But the world is changing quickly and global rates of breast cancer with it. As developing nations have rapidly adopted the lifestyle of developed nations, rates of breast cancer have risen rapidly. One key example of this is South Korea, where as recently as two generations ago rates of breast cancer were some of the lowest in world. Today – with one of the most advanced economies in the world – it has rates of breast cancer that may soon mimic those of the United States. In the years between 1993 and 2009 the rates of breast cancer in women age 50 – 69 years old increased by three percent a year, a rate that can seem modest

but that is actually one of the highest in world. South Korean women under 50 now have rates of the disease close to those of women in the United States.

One key reason for such a marked change is a swift shift in certain key reproductive factors linked to breast cancer. In South Korean women born between 1920 -24, the average age of having a first period was close to 17 years old. In women born between 1980 – 85, this dropped to just under 14 years old <sup>49</sup>. Number of children dropped similarly, with the average South Korean woman having six children in 1960 to just one in 2010 <sup>50</sup>. At the same time, the average age of having a first baby increased to age 30 – on par with the United States and countries in Europe.

More recently, China has also followed this pattern of change, and will see similar increases in rates of breast cancer.

Surely, such economic advances enjoyed by developing countries have vast benefits – lifting people out of poverty and improving health care, to name just two. Yet, when it comes to breast cancer, it marks an increased global burden of the disease, and at a time when many developing countries are still battling high rates of infectious diseases, like HIV, malaria, and hepatitis.

One positive point these trends illustrate, however, is that breast cancer rates are not set in stone. They can be changed. Of course, when rates increase because of factors intertwined with societal

change, they can be difficult to reverse. As economies advance, families have fewer children, have children later, and have jobs and lifestyles that can promote weight gain and discourage exercise. Basically, it leads to a toxic breast cancer environment. Yet, even as societal changes lead to greater rates of breast cancer, policies to address things like obesity, family leave, and workplace opportunity, can certainly help reverse them as well. In fact, such policies may be key to controlling the burden of the disease in the United States and beyond.

## **Being a Smart Consumer of Health Information**

Although the modern version of the Internet has been around for close to twenty years, it still functions a lot like the Wild West. This is especially so when it comes to health information. Although there has always been unreliable and outright dangerous health information available to consumers, it often had limited reach simply because it had to be typed, printed, and physically distributed to people. Now, with the click of a mouse or touch of a finger, information of all types can be distributed to millions worldwide. Determining what health information is reliable and what is not can be exceptionally hard, even for those well versed in science and health.

These tips can help you weed out the bad information, focus on the good, and make better sense of it all.

## **Taming the Wild West of Health Information**

*Focus on a few key information sources.* Probably the best way to make sure you're getting the most reliable health information possible is to rely on a handful of reputable health sites that largely come from the non-profit, government, or university setting. For breast cancer, this includes places like the National Cancer Institute, American Cancer Society, Breast Cancer Research Foundation, National Library of Medicine, and Susan G. Komen. News sites like the New York Times, WebMD and Intellihealth can also be good sources of information. Stay away from sites that do not clearly describe who they are and what their qualifications are for providing health information.

*If it sounds crazy, it probably is.* Who doesn't love a good conspiracy theory? And in many ways, it's conspiracy theories and other wild tales that are part of the reason the Internet – and the world at large – is so entertaining. Yet, no matter how engaging they are, conspiracy theories should not be the basis for decisions you make about your health. Countless websites will tout “hidden” or “secret” information about the causes of breast cancer, often accusing big science and big academia of suppressing such information. Statements like this should be huge red flags because this is not how science works. Science is built on constant, open deliberation and re-evaluation. If a site touts something not discussed in more mainstream scientific circles, it's simply because it lacks enough good evidence to

warrant discussion. If you read something and have a question about it, visit a reputable site to see if it has merit.

*Know a bit about different types of health studies.* This can be a little dry, but to really be able to understand a lot of the health information out there, it's important to have at least a general idea of the different types of research studies and how they work.

Lab vs. animal vs. human studies

This is one of the most important distinctions when it comes to parsing health information. Why? Because the results of research studies often get reported and written up and batted around the Internet without much, if any, discussion of what was actually the focus of the study. Was it cells? Was it tissue? Rats? Humans? Extraterrestrials? The answer to such questions has a very important bearing on the conclusions you can draw from a study's results. Cancer studies done in labs, whether on cells or in animals, are most often used to generate ideas for further research. Although these studies sometimes grab headlines, they rarely should – at least not in the context of human cancer. It can seem simplistic to say, but cells and animals are not humans. So it's incorrect to assume that results from these lab studies have immediate meaning for how cancer in humans is diagnosed, treated, or prevented. To begin to draw those conclusions, studies need to be done in actual humans – and even then, things can be complicated.



## Human Studies

There are many different types of studies done in humans. Three main types that are most important for cancer research are case-control studies, cohort studies, and randomized controlled trials.

### Case-control studies

Though there are a lot of factors to consider, case-control studies are typically the least reliable of these three types of studies. This is largely because they take people who have been diagnosed with cancer (the cases) and who haven't been diagnosed with cancer (the controls) and look at data from the past to determine what might be linked to the cancer cases. Looking into the past for information opens up a lot of room for error, with inaccurate records or clouded recall. Like lab studies, case-control studies are often good jumping-off points for further study with more reliable methods.

### Cohort studies

Cohort studies, when well designed, provide very reliable results. These studies take a group of people (a cohort) and follow them over time (sometimes decades) taking note along the way of many different factors and characteristics and then seeing which ones may relate to cancer. Because data are collected over time, cohort studies are less likely to have flawed data compared to other types of studies. The ability to follow people for many years also make cohort studies good methods for studying diseases that can take many decades to develop, like cancer.

## Randomized controlled trials

Randomized controlled trials are the type of study most people think of when they think about research studies. A group of people is randomly assigned to a study group or a control group. The study group gets some sort of targeted intervention – such as a change in diet or a new screening test – and the control group does not. The two groups are then followed over time and rates of disease in each group are compared to see what impact, if any, the intervention has had.

Randomized trials are most often referred to as the “gold standard” for research, with cohort studies resting in some second tier. This is a convenient way to think about it, but the balanced reality is that each study has its place (see figure). Well-designed randomized trials can be very good at answering targeted questions over a limited time frame. Well-designed cohort studies can be very good at answering a wider range of questions over a much longer time frame. The evidence on any single topic needs to take all studies into account and be looked at as a whole.

## Study Strengths & Weaknesses in Cancer Prevention Research

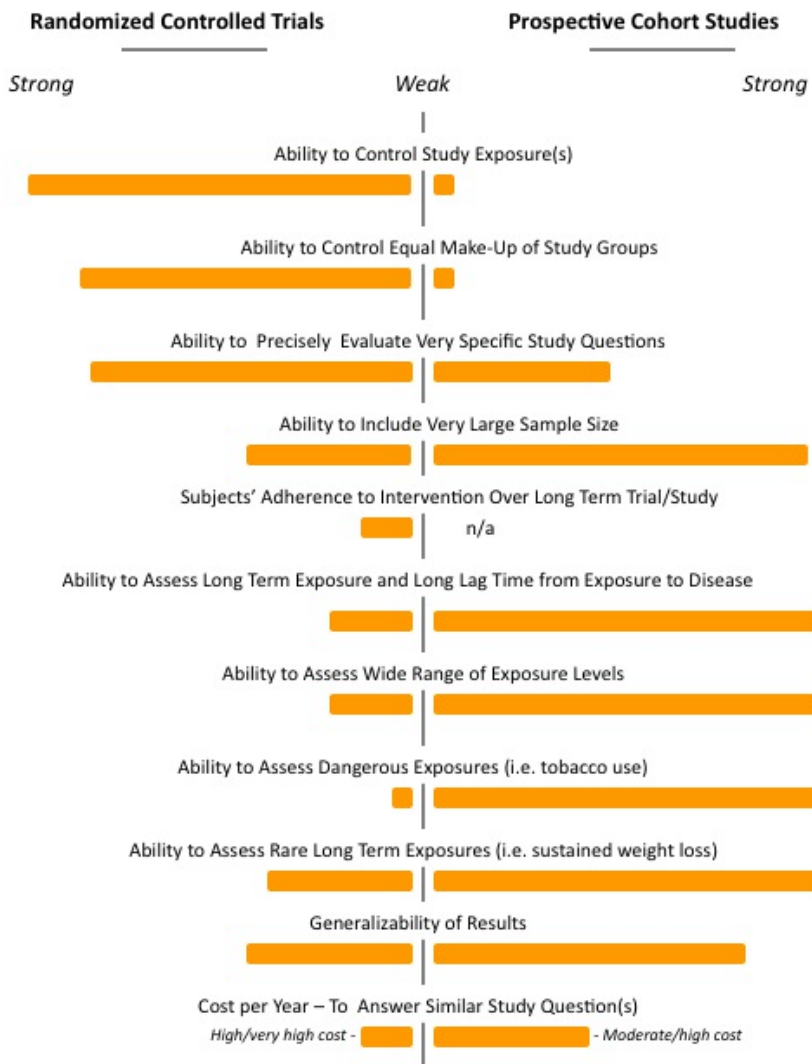


Figure - Strengths of weakness of randomized trials and prospective cohort studies

*Big studies vs. small studies.* Of course there are always exceptions, but for the most part, larger studies provide more reliable results than smaller studies. This is because the more people you have in a study the less chance there is that the results are due to chance. The famous Nurses' Health Study follows over 60,000 women over time. The Million Women Study, not surprisingly, counts over a million women participants. These large and well-designed studies are able to provide very reliable results. In contrast, results from studies with small numbers, in the double digits, even in the hundreds, should usually be viewed cautiously.

### **Making Health Studies Make Sense**

*Read the headline, then look for context.* News stories, and headlines in particular, about research results are meant to grab attention. And they usually do a good job at that. Where they often fall short is providing context, explaining where a new finding actually fits with other findings on a subject. And this is key when it comes to knowing how much importance to place in a new study or report. Does it confirm what other studies have found? Is it a completely different result? In science, it is the complete weight of evidence on a topic that drives conclusions, health guidelines, and recommendations – not the results of a single study. So, as intriguing as the results of a single study

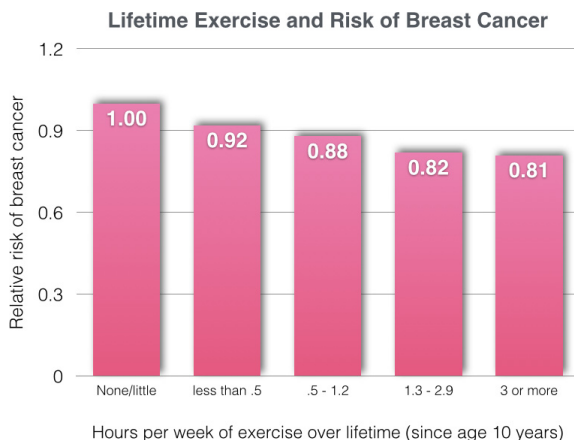
might be, what matters most is what all the results of all the studies on a topic show. If a new report doesn't provide this information, do a little bit of searching on you own, and you'll likely be able to find one that does.

### **Reading the Risk Factor Figures in *Together***

Though they may cause some unpleasant flashbacks to high school math, the figures in *Together* that show how various risk factors affect breast cancer risk are actually pretty easy to understand. In each of these figures, when a bar falls below 1.0, that depicts a drop in risk associated with that level of risk factor. And when a bar rises above 1.0, that depicts an increase in risk.

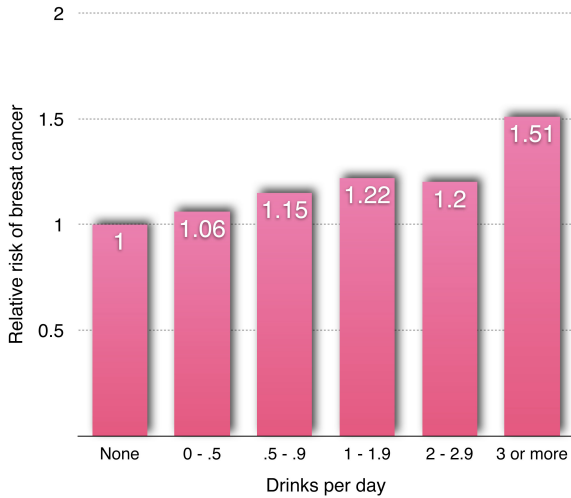
Not to get too complicated, but these figures show a specific type of risk called "relative risk." All this means is that the increase or decrease in breast cancer risk linked to a specific factor is in comparison to women who do not have that risk factor.

Let's look at exercise as an example. [Figure 9](#) reprinted below shows the risk of breast cancer in women who exercised compared to women who didn't exercise. The inactive group is the group that the other groups are being compared to, so it has a relative risk of 1.0. Compared to this group of inactive women, the group that exercised three or more hours per week had a relative risk of breast cancer of 0.81. This means that the exercising women had a 19 percent *lower* risk of breast cancer compared to those who didn't exercise ( $1.0 - 0.81 = 0.19$ ).



The same thing applies to factors that increase risk. This time, let's look at alcohol. In [figure 11](#) reprinted below, the comparison group is women who didn't drink, so it has a relative risk of 1.0. Compared to this group, women who drank three or more drinks per day had a relative risk of 1.51. This translates to a 51 percent *increase* in the risk of breast cancer compared to women who didn't drink.

## Adult Drinking and Risk of Breast Cancer



## More Information to Explore

Your Disease Risk  
[yourdiseaserisk.wustl.edu](http://yourdiseaserisk.wustl.edu)

Zuum – Health Tracker  
[zuum.wustl.edu](http://zuum.wustl.edu)

Cancer News in Context  
[cancernewsincontext.org](http://cancernewsincontext.org)

National Cancer Institute

cancer.gov

American Cancer Society  
cancer.org

Healthfinder  
healthfinder.gov

National Library of Medicine  
medlineplus.gov

Harvard's Nutrition Source  
nutritionsource.org

ABIM Foundation  
Choosingwisely.org



## About the Authors

### **Graham A. Colditz, MD, DrPH**

Dr. Colditz was born in Australia and received his B.Sc. and medical degree from the University of Queensland, Australia, and his M.P.H. and Doctorate in Public Health from Harvard University School of Public Health. In 1990 he was elected a Fellow in the Australian Faculty of Public Health Medicine, Royal Australasian College of Physicians.

For 25 years Dr. Colditz was at Harvard University where he served in a number of positions. From 1996-2006 he was principal investigator on the Nurses' Health Study, a longitudinal study established in 1976, of 121,701 nurses, investigating risk factors for major chronic diseases in women. He established and was the founding principal investigator on the Growing Up Today Study relating diet and lifestyle of 16,883 adolescents ages 9 – 14 at entry to their growth and health outcomes. In 1998, he was promoted to full professor of medicine at Harvard Medical School and professor of epidemiology at the Harvard School of Public Health. Dr. Colditz was also associate director of Channing Laboratory, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School from 2005-2006. He was director of the Harvard Center for Cancer Prevention at HSPH and within the Dana-Farber/Harvard Cancer Center he was deputy

associate director for shared resources and leader of the Cancer Epidemiology Program.

With longstanding interest in the causes and prevention of chronic disease, particularly among women, Dr. Colditz has evaluated numerous lifestyle factors, documenting that current use of postmenopausal hormone therapy increases the risk of breast cancer. He has developed statistical models to more accurately classify levels of risk for several cancers. Other areas of his expertise include tobacco and obesity in relation to cancer. He also documented that smoking increases risk of stroke and total mortality among women, and that weight gain increases the risk of diabetes. He has focused extensively on the validation of self-report information for use in large-scale epidemiologic studies and refined diet assessment tools for use in public health settings such as WIC. He has devoted much effort to the application of scientific advances in cancer prevention to broader population programs working with the American Cancer Society and the Massachusetts Cancer Control Program. He also developed the website [\*Your Disease Risk\*](#) to communicate tailored prevention messages to the public. He leads a team writing the [\*Cancer News in Context\*](#) blog.

Dr. Colditz has filled many professional leadership roles. He served as editor-in-chief of the journal *Cancer Causes and Control* from 1998 to 2006. In 2004, Dr. Colditz was awarded the American Cancer Society-Cissy Hornung Clinical Research

Professorship. He has contributed to reports of the Surgeon General on Tobacco and Health, and served on committees of the National Academies of Science addressing Health Effects of exposure to herbicides in Vietnam Veterans (1992-1995 and 1995-1996), and the Committee to Assess Potential Health Effects from Exposure to Pave Paws Low-Level Phased Array Radiofrequency Energy. He also contributed chapters to the report from the National Academy of Science, *Fulfilling the Potential of Cancer Prevention and Early Detection*. He has served on the National Cancer Institute scientific peer review committees; Subcommittee E (program projects) and Subcommittee A (Cancer Center Support Grants); and Chaired the Center for Scientific Research EPIC study section (2009-11). He currently serves on the NCI Board of Scientific Advisors. Dr. Colditz also serves as an external advisor to a number of NCI designated comprehensive cancer centers including the Norris Cotton Cancer Center at Dartmouth, The H Lee Moffitt Cancer Center, Tampa, Florida, The Ohio State University Cancer Center, and the MD Anderson Cancer Center.

In October 2006, on the basis of professional achievement and his commitment to public health, he was elected to membership of the Institute of Medicine, an independent body that advises the U.S. government on many issues affecting public health. In 2009 he received the Alumni award of merit from the Harvard School of Public Health. In 2011 he received the American Cancer Society Medal of Honor for Cancer Prevention and Control. In 2012, he

received the AACR - American Cancer Society award for research excellence in cancer epidemiology and prevention, and in 2014, the ASCO-American Cancer Society award and lecture.

Dr. Colditz is a [highly cited medical researcher](#). He has edited numerous books on cancer prevention and health promotion, and the Encyclopedia of Cancer in Society. Citations and citation metrics can be found at: <http://www.researcherid.com/rid/A-3963-2009>.

Dr. Colditz is chief of the Division of Public Health Sciences in the Department of Surgery and currently directs the Master of Population Health Science program at Washington University School of Medicine <http://www.mphs.wustl.edu>. This 10 month program is designed for physicians seeking training in population health science research methods. He is principal investigator of the Program for the Elimination of Cancer Disparities at Siteman Cancer Center and leads studies addressing causes and outcomes of breast cancer and multiple myeloma.

### **Katherine N. Weilbaecher, MD**

Katherine N. Weilbaecher, MD is an oncologist who specializes in treating breast cancer. She is also a researcher who focuses on understanding the biology of metastasis. Much of her research is on how bone cells interact with tumor cells to support the growth of metastases. Dr. Weilbaecher is a Professor of Medicine at Washington University School of Medicine, St. Louis and co-leads

the research program in breast cancer at the Siteman Cancer Center.

Dr. Weilbaecher received her medical degree from Stanford Medical School and completed her oncology fellowship at the Dana-Farber Cancer Institute at the Harvard Medical School in Boston before joining the faculty at Washington University School of Medicine in 2000. She received her undergraduate degree from Harvard University.

### **Hank Dart, MS**

Hank Dart, MS is a Health Communications Lead who works in prevention and control for the Siteman Cancer Center at Washington University School of Medicine. He was first introduced to the power of prevention and the importance of healthy behaviors in an undergraduate class on cardiovascular disease at Stanford University taught by Dr. Abby King. Since that time, he's dedicated his career to one overarching goal – helping people improve their lives by providing them with tools and incentives to take charge of their health.

He has worked for 20 years in health education and health communication, both on the federal level and in academia. He is currently the project leader of the popular and award-winning health risk assessment website, [\*Your Disease Risk\*](#), and its spin-off mobile app, [\*Zuum\*](#). His primary interest is in distilling complex scientific findings into useful messages for the public. He has

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# Appendix

## Short Risk Assessment Tool

A [brief tool](#) to assess the risk of heart disease, stroke, diabetes, and cancer.



There's a lot you can do to lower your risk of cancer, heart disease, stroke, and diabetes. Take this quiz to estimate your risk of these diseases and highlight steps you can take to improve your health. For a more detailed estimate of your risk for specific types of cancer and other diseases, please visit [www.yourdiseaserisk.wustl.edu](http://www.yourdiseaserisk.wustl.edu)

Look at each statement. If it describes you, circle all the numbers in the boxes to the right. If it doesn't describe you, simply leave the row blank. When you're done, add the circled numbers in each column to see which disease risk category you're in.

	Cancer	Heart Disease	Stroke	Diabetes
Tobacco Use: I smoke -- even sometimes	3	3	3	1
Weight: I have gained 20 lbs or more since age 18.	1	2	1	3
Physical Activity: I get less than 30 minutes of moderate activity (like walking) or more daily.	1	1	1	1
Red Meat: I eat 2 or more servings of red meat per week.	1	1	1	
Multivitamin: I do <u>not</u> usually take a multivitamin.	1	1		
Fruits & Vegetables: I eat fewer than 3 servings of fruits & vegetables per day.		1		1
Whole Grains: I eat fewer than 3 servings per day of whole grains (like whole wheat bread, brown rice, oatmeal or whole grain cereal).	1	1	1	1
Mono and Poly-Unsaturated Fats: I eat oil-based salad dressing or use liquid vegetable oil for cooking three or fewer days per week.		1		1
Alcohol: I average more than 1 alcoholic drink per day (One drink is one beer, one glass of wine, or one shot of other alcohol).	1			
Screening	1			
AGE 50 and OVER ONLY: I have <u>not</u> had a colonoscopy in the last 10 years.				
FEMALE ONLY: I have <u>not</u> had a Pap test in the last 3 years.	1			
Family History: I have a family history of the following diseases (circle only those that apply)	1	1	1	1
<b>TOTAL</b>				

\* including the most common cancers: prostate (men), breast (women), lung, and colon

Your risk, compared to someone your age and sex: Scoring: 0-2 Below average 3-4 Average 5+ Above average

Flip the page over to see what your risk means and the important steps you can take to stay healthy. →



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[www.siteman.wustl.edu](http://www.siteman.wustl.edu)

800-600-3606

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