BREASTS

THE OWNER'S MANUAL

EVERY WOMAN'S GUIDE

TO

REDUCING CANCER RISK,

MAKING TREATMENT CHOICES,

AND

OPTIMIZING OUTCOMES

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FOREWORD BY SHERYL CROW

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To the women and girls all over this wonderful world who have—or had—breasts.

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Author's Note

My mom was thirty-six years old and had five children under the age of fourteen (I was two) in December 1971. She was in peak fitness as a competitive A-level tennis player who swam daily when she suffered a stroke and inexplicably fell into a coma that lasted three weeks. The UCLA doctors told my father on multiple occasions not to leave for home that night, for she would surely die by morning. A priest administered the sacrament of last rites, which I believe made heaven take notice: *Oh heck no, we aren't ready for that ornery MaryAnn; give her another fifty-plus*. So she woke up! (If you ever meet me—and I hope you do—ask me *how* she woke up.) My mom remained in rehab for a year before returning home, relearning how to speak and how to walk, since she would never move her right side again (hemiparesis). All of my parents' "friends" disappeared and my dad downsized the house, but his love for her never diminished; in fact, it grew. To this day, in their late eighties, he defends her fiercely and assists her tenderly. How could you not cherish a warrior who stared down death and won—without speaking a word?

That's where I come from, and that's what I offer you. I possess the dogged determination and tenacity of my mother, mixed with the empathy and compassion of my father. So when you fling excuses and hopelessness at me, I will whack you with a reality check. And when you come to me scared and broken, I will hug you until you're whole again.

After my relationship with God, I only really care about two things in this life: loving family and killing cancer. You picked up this book. You're family now, so let's get going.

CHAPTER 2

Debunking Breast Cancer Myths

In this book, we'll talk at length about how to eat, drink, exercise, and behave in ways that optimize breast health and reduce your risk of cancer—all supported by credible, exciting research. But for as much useful information that's out there, way too many myths persist that confuse and distract us from what we need to know. I can't tell you how often patients come to me paralyzed with fear because they've read or heard that something they've done in the past—or currently do—will ruin their health. Genetic myths, imaging myths, cancer myths, dietary myths, environmental myths: I could play volleyball all day with all the false ideas flying around—set up, smash, repeat.

I know, I shouldn't be carrying my cell phone in my breast pocket . . .
My nutritionist said to eat grass-fed beef. That reduces cancer, right?
Did my IVF drugs give me this breast lump?

Oh, ladies. Let's let go of the anxiety and misinformation you've unwittingly come to trust and start implementing the meaningful changes that science shows will help you live a longer and more vibrant life. It's time to debunk the most common breast myths that have kept your armpits smelling and your cell phone ten feet from your wireless bra.

THE TRUTH ABOUT GENES, GENDER, AND DESTINY

As I've mentioned, genetics play a less important role than you probably think. Patient after patient tells me that because there isn't any breast cancer in her family, she's not really at risk. Yet 85 percent of women diagnosed with breast cancer do not have a *single* relative with breast cancer. In fact, only 5 to 10 percent of breast cancers currently prove to be hereditary, meaning that they occur because abnormal gene mutations pass from parent to child. Of course, a vitally important part of assessing your risk includes genetic screening and family history, and I encourage every woman to use the free test on our website to see whether further testing would be warranted (pinklotus.com/genequiz). But if we can only blame our parents' DNA 10 percent of the time, then factors outside of inherited genetics cause breast cancer 90 percent of the time. A major goal of this book is to teach you how to proactively make daily choices that reduce nongenetic cancer risk. Why passively await a breast cancer diagnosis when you can get actively involved in deterring it?

Patients also think their mother's family history of breast cancer matters much more than their father's. Clearly, you are 50 percent your father's DNA. You inherit genes from both sides—your maternal *and* paternal family histories count equally. Even doctors get this wrong. So when assessing familial risk, don't just pay attention to your maternal lineage. Look at relatives on both sides going three generations backward (e.g., grandparents, aunts, cousins) and forward (e.g., children, nieces, nephews). When reviewing your father's side, look for breast and ovarian cancers hiding in the women of more distant generations. Especially when the family tree lacks ladies, pay attention to mutation-associated cancers that show up more frequently in men than breast cancer, such as early-onset colon, prostate, and pancreatic cancers.

And speaking of the guys, most think they can't get breast cancer, but since they actually do have breast tissue, they're susceptible too. Male breast cancer accounts for approximately 0.8 percent of all breast cancer

cases, about 2,470 men annually.[1] In American men, the lifetime risk of breast cancer approaches 1.3 in 100,000.[2] Interestingly, stage for stage, men survive cancer at the same rates as women; however, due to a lack of awareness that male breast cancer is even a possibility, their diagnoses usually come at later stages, increasing overall mortality rates.

Another erroneous myth about breast cancer relates to age—that it only happens to older people. While certainly less common among premenopausal than postmenopausal women, breast cancer does not discriminate when it comes to age. In the United States, 19.7 percent of all breast cancers and 11 percent of all breast cancer deaths occurred in women under fifty years old (specifically, 48,080 invasive breast cancer diagnoses, 14,050 *in situ* cancer diagnoses, and 4,470 breast cancer deaths befall women under fifty years old).[3] In fact, the median age of breast cancer in the US is sixty-two years old, which means that exactly 50 percent of breast cancers are diagnosed under the age of sixty-two, and 50 percent are diagnosed at or over age sixty-two. No matter what your age, cancer cells shrink at the sight of healthy living, so we can employ the anticancer strategies in this book during all decades of life.

Finally, the misunderstood stat that all women have a 1 in 8 chance of getting breast cancer is one of the most commonly quoted statistics out there. While it's correct, truth be told, you don't walk around every day of your life with 1 in 8 odds of getting breast cancer! If that were true, you'd probably have cancer by next month. Breast cancer risk increases as you get older. A woman's chance of being diagnosed with breast cancer during her twenties is 1 in 1,567 (not 1 in 8); her thirties, 1 in 220; forties, 1 in 68; fifties, 1 in 43; sixties, 1 in 29; seventies, 1 in 25; finally reaching the oft-quoted 1 in 8 as a *cumulative* lifetime risk once she hits eighty.[4] You know those pictures with a lineup of eight "woman" icons like the ones you see on a public restroom door? They sport a caption that reads, "One in eight women will develop breast cancer in her lifetime." Really, the icons should not be youthful triangles. We need a few canes and wheelchairs in there to more accurately reflect risk as it pertains to age.

FACT: YOUR DIET MATTERS—A LOT

Frankly, one of the most dangerous falsehoods circulating out there states that your diet doesn't impact breast health, which is completely bananas and wrong. What you put into your body influences estrogen levels, inflammation, blood vessel formation, cellular function, and destructive free radicals, to name a few cancer-related processes. What's more, the core genetic mutation within a cancer cell cross-talks with hundreds of other genes, turning them on or off to suit the cancer's survival instincts. Cancer growth isn't the handiwork of a single gene; it's the product of a network of genes. A human study in men with prostate cancer proved that by using *only diet and healthy lifestyle* interventions, the cross-talking chatter got turned down in 453 bad genes, and turned up in forty-eight good ones.[5] Oh yes, nutrition matters, you can bet your life on it. I've devoted the next two chapters to foods that work to enhance breast health or flat-out destroy it, but a few phony food rules come up so often that I'd like to take a moment to slam them down.

First up, wake up to coffee. A lot of the women I meet believe that coffee causes breast cancer, but absolutely no link exists between your sacred cup of joe and breast cancer.[6] In fact, mounting evidence suggests that coffee might actually have a preventive effect.[7] That being said, the caffeine in coffee isn't always a plus for your breasts, as it can increase breast pain and breast cysts, particularly in young women with fibrocystic breast changes—but that's not cancer. So if your breasts don't hurt, it doesn't hurt your breasts to love a latte.

And speaking of lattes, the idea that dairy causes breast cancer is unproven. Evidence from more than forty case-control studies and twelve cohort studies does not support an association between dairy product consumption and breast cancer risk.[8] It sounds intuitive to say that the presence of hormones, growth factors, fat, antibiotics, and chemical contaminants often found in dairy would lead to a proliferation of cancer cells, especially hormonally sensitive breast cancer cells, but the evidence contradicts our intuition. That being said, dairy *is* a major source of

saturated fat, so you must be mindful of how fat influences your risk, which we discuss in chapter 4.

People often consider meat to be as culpable of causing breast cancer as dairy, and at first blush, the evidence seems to point toward the fact that no causative link exists between the consumption of red meat, white meat, total meat, or fish and breast cancer.[9] Hit the brakes and screech to a skidding stop! Ladies, it took my writing this book to live inside the hundred-plus confusing and contradictory breast/meat studies and really figure it out. Meat is *so toxic* to your breasts that even the *slightest* consumption of it nullifies a measurable difference between "high" and "low" meat consumers. Only when you compare *zero/zippo* meat consumption to *any* meat consumption might you arrive at the truth. Minimize meat. See you in chapter 4 to understand why.

Finally, I hear from a lot of my most nutrition-savvy patients that acidic foods alter the body's pH balance to the extent that it could cause breast cancer. But here's the thing: your body tightly regulates your blood pH to be 7.35 to 7.45 no matter what you eat, and even minor changes to this range would cause severe symptoms and life-threatening illness. According to the American Institute for Cancer Research, this myth clashes with everything we know about the chemistry of the human body. There isn't much wiggle room, since a pH outside of 6.8 to 7.8 equals certain death. And don't be fooled by test kits said to rate your body's acidity through urine. If you check the pH of your urine, and it's not a perfect 7.35, that's because your body constantly fine tunes excess acid or base to maintain proper *blood* pH balance, and it does so by excreting the excess in your urine.

That said, it's true that cancer cells flourish in acidic microenvironments.[10] However, it's the cancer *itself* that creates the acid it bathes in, so consuming low pH foods doesn't provide a happy place for cancer; cancer doesn't even need you for that.[11] Besides, stomach juices are pure acid at pH 1.5 to 3.5. Your alkaline water slides down the esophagus and splashes right into an acidic bath; it will not change your body's pH, and it will not neutralize a cancer cell's acidic little world. I will say that the

foods you would consume in a (futile) effort to change your pH to more alkaline (nuts and veggies) actually pack a massive punch to cancer cells via high antioxidant levels, DNA–damage control, and immune system support, but it's not from making you alkaline.

BOGUS LIFESTYLE BELIEFS

We'll dive into the lifestyle changes that matter most in chapter 5, but I'd like to first clear the decks on certain popular myths so you don't think I'm skipping these.

Let's talk bras. They don't start or stimulate breast cancer, thankfully, because we need their unwavering *support*. Underwire bras, tight bras, sleeping in a bra, or wearing a bra more than twelve hours a day has no connection to risk. I've heard the claims, and initially they seem so plausible that one might believe they have a basis in fact. I repeatedly hear two schools of thought. One involves stating that tight bras compress the lymphatic system of the breast, which leads to toxins building up within the breast tissue itself, deleteriously altering the cells. This has no grounding in breast anatomy or physiology. We treat breast lymphedema (a blockage of lymphatic fluids within the breast) with, among other strategies, *breast compression*.[12] The other smart-sounding hypothesis proposes that the underwire itself conducts environmental electromagnetic fields (EMFs). As you will read in a minute, even if this antenna theory were true, EMFs don't cause breast cancer.

A 2014 study compared bra-wearing habits between postmenopausal women with and without invasive breast cancer. Researchers found that details such as cup size, underwire presence, age first beginning to wear bras, and average hours worn were not associated with an increased risk of breast cancer.[13] So, ladies, whatever you feel is appropriate in terms of chest support, I support you.

Next up: antiperspirants and deodorant. You can officially slow your search for the ultimate natural substitute because no scientific evidence

backs the claim that antiperspirants or deodorants cause breast cancer, either because of toxin buildup or aluminum exposure or parabens.[14] As a reminder, antiperspirants block the pores with astringents such as aluminum chlorohydrate so that they can't release sweat, thereby preventing bacterial buildup and odor. On the other hand, deodorants don't prevent sweating but rather neutralize the smell of excess bacteria by combining fragrances that mask odor with propylene glycol that creates an environment where bacteria can't grow.

One cancer-linking theory purports that pore-plugging aluminum compounds absorbed near the breast contain estrogen-like activity.[15] As we will review later, estrogens feed and fuel the majority of breast cancer cells. Therefore, the presence of estrogen-behaving compounds might increase the division of cancer cells. A second study suggests that aluminum itself directly negatively affects breast tissue cells.[16] But a 2014 systematic review of peer-reviewed literature regarding potential health risks posed by aluminum concluded that no such relationships exist.[17]

Maybe it's not the aluminum? One publication found traces of a preservative called parabens inside a tiny sample of twenty breast cancer tumors.[18] As "endocrine disrupters," parabens demonstrate weak estrogen-like properties, but the study in question made no cause-and-effect connection between parabens and breast cancer, nor did it conclusively identify how they got there in the first place. Parabens have even been found inside tumors when women don't use underarm products at all.[19] Besides, the dose of parabens required to initiate a mutation in a human breast would be much higher than that absorbed through the application of a stick or spray. Additionally, most brands no longer use parabens, but if you're still worried about this, choose a product that specifically says *paraben-free* on the packaging.

Another widely circulating rumor claims that antiperspirant prevents you from sweating out toxins, which can then accumulate in the lymph nodes and cause breast cancer. To draw conclusions that wipe the sweat off our concerned brows (and pits), we need epidemiologic studies that compare two groups of people who are alike except for one deodorant

factor. Luckily we have a few. In 2002, researchers at the Fred Hutchinson Cancer Research Center in Seattle conducted an epidemiologic study to address the sweat issue and other antiperspirant-related toxicity theories. They compared 1,600 women with and without breast cancer and found no link between breast cancer and antiperspirants, with or without shaving.[20] A similar but smaller Iraqi study of 104 women with and without breast cancer also showed no link.[21]

The only published epidemiologic study with a competing point of view observed 437 Chicago-area breast cancer survivors and divided them according to underarm habits.[22] The author found that women who used antiperspirant/deodorant earlier in life and more frequently and with underarm shaving were statistically more likely to develop breast cancer at an earlier age. He theorized that aluminum salt substances found in these products entered the lymphatic system through nicks in the skin caused by shaving. However, this study did not demonstrate a conclusive link between underarm hygiene habits and breast cancer. Furthermore, a major study no-no existed: the omission of a control group of women *without* breast cancer. The studies with the most research cred always have a control group. And one more thing: girls who use deodorant and shave earlier than others probably went through puberty sooner. Strong evidence shows that the earlier periods start (menarche), the higher the breast cancer risk.

The National Institutes of Health (NIH), American Cancer Society (ACS), National Cancer Institute (NCI), and the US Food and Drug Administration (FDA) report that no conclusive evidence links the use of underarm antiperspirants or deodorants to the development of breast cancer. On the flipside, some argue that we see a lower prevalence of breast cancer in developing countries where women don't use these products. But in Europe, where antiperspirants are not widely used, the rate of breast cancer is *higher* than in the United States,[23] so it seems that factors much more influential than sweat-stopping antiperspirants and odor-eating deodorants are at play.

While we're talking chemicals, let's move on to hair relaxers,

particularly those feared to cause cancer in African American women. No doubt about it: cancer-causing compounds abound in hair products, but luckily for African American women who sport straight and silky hair, hair relaxers don't make a cancer connection. Hair relaxers or straighteners, in the form of lotions or creams, chemically straighten curly hair by altering the hair's internal structure. Product ingredients can enter the body through scalp burns or open cuts and sores. Since millions of African Americans use relaxers to reduce curl—one study found that 94 percent of African American women surveyed under age forty-five had used them at some point in their lives—these products have become the subject of much scrutiny, particularly as they may or may not relate to causing breast cancer.[24] Funded by the National Cancer Institute (NCI), researchers followed over 48,000 African American women for six years in the Black Women's Health study.[25] A number of parameters were evaluated with respect to health and habits. Participants included women who had used hair straighteners seven or more times a year for twenty years or longer. When analyzing the 574 new cases of breast cancer that occurred during the study, researchers could not find any association between breast cancer risk and the duration of hair relaxer use, frequency of use, age at first use, number of burns experienced during use, or type of hair relaxer used.

Perhaps what we should be focusing on isn't straighteners specifically, but the fact that there are numerous and potentially cumulative health hazards hiding in our self-care products—particularly in African American communities. Specifically, hair products including shampoos, conditioners, oils, dyes, relaxers, and root stimulators containing estrogens and placental extracts can mimic estrogen in our bodies so much that use of these hair products in early life has been considered a major contributor as to why the proportion of girls who experience early puberty is nearly four times greater at age eight for African Americans than for whites (48.3 percent and 14.7 percent, respectively).[26] Check hair product labels and avoid using ones that contain estrogens, other hormones, and placenta, particularly for young children or while pregnant.[27]

PIERCINGS AND TATS

If you're worried about the nipple piercings and body tattoos you got during your punk phase in college, let me put your mind at ease. Nipple piercings don't cause breast cancer. Studies show that nipple piercings can cause breast infections, or theoretically create difficulties with breastfeeding, but they don't cause breast cancer.[28]

Tattoos also can cause infection and allergic reactions; sterile needles and uncontaminated ink minimize that risk. Unlike piercings, tattoos fall under the "not sure, probably fine" cancer category. Studies show that skin cancers do *not* occur any more frequently than would be expected at the location of a tattoo,[29] which should reassure breast cancer patients recreating a 3-D–appearing nipple and areola on mastectomy skin, or tattooing makeup in anticipation of chemotherapy-induced eyebrow and eyelash loss. On the other hand, when I remove lymph nodes during a cancer operation on someone with upper body art, the pathologist usually identifies tattoo pigment trapped within a node or two because the skin lymphatics drain ink to that location. No reports find that tattoos increase breast cancer risk, or that nodes with ink are more likely to contain metastatic breast cancer; however, ink does contain phthalates, hydrocarbons, and a number of other potential carcinogens and endocrine disruptors,[30] which as part of a larger whole, possibly impact breast cancer risk (see chapter 5). For mastectomy patients who worry about FDA warnings to "think before you ink," pretty real-looking silicone reusable nipple prostheses come in a shade that matches skin tone; they just stick in place. An option: pinklotus.com/adhesivenipple.

RADIATION REBUKES

In our increasingly tech-reliant world, a lot of patients worry about radiation affecting breast cancer risk—specifically from mobile (cell) phones and power lines. Based on the studies available, this doesn't appear to be a concern. *Phew.*

In 2018, the number of mobile phone subscriptions (6.8 billion) approached the number of people on earth (7.5 billion). Since these devices emit radio-frequency (RF) signals and electromagnetic fields (EMF), their ubiquity has generated public concern over possible adverse health effects. The real controversy centers on cell phone use and the risk for brain cancer, but breasts have a way of getting attention too.

From what we can tell, mobile phones can't cause breast cancer, even if you tuck them in your bra, because they do not emit the right type of energy (or a high enough amount of energy) to damage the DNA inside breast cells. In order to communicate with service towers, cell phones emit EMF. Body tissues absorb some of this radiation during regular phone use; usually those nearby tissues would be your face and brain, not your breast, but in the quest to be hands-free, many women tuck that smart box into a bra or shirt pocket. Here's the key concept: mobile phone EMF is nonionizing, and as such, the energy waves are too wimpy to break DNA and other biochemical bonds. Besides your phone, other nonionizing sources of radio-frequency signals include microwaves, television, radio, and infrared.[31]

In contrast to nonionizing EMF, X-rays, gamma rays, and ultraviolet (UV) radiation emit ionizing EMF. These do create enough energy to mutate DNA, which can potentially lead to cancer. Common ionizing sources include sun exposure (UV rays), and medical X-rays like CT scans and mammograms. For a cell phone's energy to go from nonionizing to ionizing, it would have to get 480,000 times stronger than it currently is.[32]

Several notable studies have examined the cell phone/cancer connection as it relates to brain tumors.[33] Only one of these authors observed an increase in brain tumors with the use of mobile phones, and all the other studies could not reproduce the correlation.[34] No study has postulated that cell phones cause breast cancer. If you carry your phone in your bra, I'd be more concerned about accidentally texting a photo of your breast to your boss than causing cellular damage to your breast DNA.

Living near power lines can't cause cancer either. Power lines emit

both electric and magnetic energy that's too muted to damage breast DNA. Additionally, walls, cars, and other objects shield and weaken the energy from power lines. When rates of female breast cancer on Long Island ranked among the highest in New York State, a 2003 study set out to explain possible environmental reasons why.[35] One theory was that EMFs caused the hike in cancer. Rather than using indirect measurements of EMF exposure (such as occupation or distance from power lines), investigators performed comprehensive in-home assessments of magnetic field exposure and only looked at women living in the same home for at least fifteen years. They compared these data between almost six hundred local women with and without breast cancer; in the end, they found no link between the disease and EMF emitted by power lines. A nationwide Finnish study and a Seattle-based study also concluded that typical residential EMF generated by high voltage power lines do not elevate overall cancer risk in adults.[36]

Similar to the EMF from cell phones, magnetic energy from power lines produces a low-frequency, nonionizing form of radiation that doesn't mess with the breast. Maintaining that the weak EMFs derived from power lines could have a catastrophic biologic effect sounds plausible to most of us because we don't readily understand physics; but to a physicist, it's a laughable proposition.[37] Consider this factoid: the magnetic field from the earth itself is 150 to 250 times stronger than ones from power lines. If a power line's small magnetic field could cause breast cancer, then just inhabiting earth for a few years should lead to a total body cancer transformation.

HORMONE-RELATED HEALTH WORRIES

A lot of women express concern that certain health habits increase their risk—most of which circle the topic of affecting your estrogen levels, since we know that estrogens feed many breast cancers. However, a bunch of these worries are, in fact, myths.

I've repeatedly heard the popular rumor that oral contraceptive pills

(OCP)—birth control pills—cause breast cancer. But if you are at normal risk for breast cancer, an unexpected pregnancy will add a lot more worry to your life than OCPs. Strong evidence from fifty-four studies concludes that current OCP users have a tiny 24 percent increase in the risk of having breast cancer diagnosed *while* they are taking OCPs and then the risk becomes 16 percent one to four years after stopping, 7 percent five to nine years after stopping, and no risk ten years out.[38] Why do I call that "tiny"? Let me make this brilliant point: if you are twenty, the probability of developing breast cancer by age thirty is 1 in 1567, so it only takes *one more* breast cancer case (2 in 1567) to suddenly proclaim that rates went up 100 percent. And since studies say it's 24 percent, your new risk will actually be 1.24 in 1567 on OCPs. Pretty tiny, right?

Depending on your personal risks, the bump in breast cancer might be offset by the fact that OCPs reduce colorectal cancer by 14 percent and endometrial (uterine) cancer by 43 percent.[39] And if you're a BRCA carrier, there's OCP good news for you too. After six years of use, OCPs reduce the risks of ovarian cancer by 50 percent for BRCA-1 and 60 percent for BRCA-2—with no increase in breast cancer.[40] All premenopausal BRCA carriers with ovaries who are not trying to get pregnant should take OCPs to slash ovarian cancer risk.

Women who have had or are considering in vitro fertilization (IVF) also shouldn't fret that it causes breast cancer. Given the causative connection between hormones and breast cancer, fertility treatments have come under suspicion since they involve ten times the normal exposures of estrogen and progesterone each time the ovaries are stimulated.[41] No evidence strongly connects fertility drugs with increased risk. A multitude of studies conclude that prospective moms using any of the ovarian stimulation medications associated with IVF, including clomiphene citrate (Clomid), gonadotropin-releasing hormone (GnRH antagonist, Lupron), human chorionic gonadotropin (hCG), follicle stimulating hormone (FSH), luteinizing hormone (LH), and progesterone, do not have a higher risk of breast cancer.[42] In fact, works published since 2012 on the matter not only suggest a lack of interaction, but even a protective role of ovarian stimulation, as

emphasized in two meta-analysis studies that pool the results of over 1.5 million infertile women who underwent IVF. [43] And for those of you who have endured over seven cycles of IVF, I have reassuring news: the largest, most comprehensive study to date followed over 25,000 infertile Dutch women for twenty-one years, and guess what? Your tenacity paid off (I hope with a baby too): breast cancer risk was significantly *lower* in women undergoing seven or more cycles compared to those receiving one to two cycles.[44] For all the twenty-one years they were followed, breast cancer risk among IVF-treated women was no different from that in the general Dutch population.[46] There are naturally exceptions, but they're few. One notable study from Australia did find an increased rate in women starting IVF under the age of twenty-four, but that's an unusually young group to enlist IVF often, and the study otherwise showed no overall increase in risk.[45]

Abortions and stillbirths don't cause breast cancer either, though a link has often been suspected due to the estrogen surges that occur with pregnancy. I want all of you affected personally by any type of terminated pregnancy to read on and know this good news applies to *you*! When most women hear the word *abortion*, they commonly consider that word to mean an *induced* abortion, a medical procedure performed to voluntarily end a pregnancy. But there's also the natural event of a *spontaneous* abortion, more commonly referred to as a miscarriage, which means the loss of a fetus before five months (twenty weeks) into the pregnancy. These generally result from genetic issues with the fetus that are incompatible with life, or from problems with the environment in which the unborn child is growing. And then there's a *stillborn* birth, which refers to the death of a fetus after five months' gestation while still in the uterus. While the cause is usually unknown, common identifiable reasons include nicotine, alcohol, or drugs taken by the mother, physical trauma, umbilical cord problems, Rh disease, and radiation poisoning.

Research examining whether abortions cause breast cancer should relieve any concerns you have. Data from fifty-five studies spanning sixteen countries and including 83,000 women with breast cancer show

no connection between breast cancer and spontaneous or induced abortions.[46] A panel of over one hundred leading world experts convened by the National Cancer Institute (NCI) in 2003 performed a rigorous review of the scientific evidence regarding abortions and breast cancer risk.[47] They concluded that no correlation exists between breast cancer and abortion, either spontaneous or induced. They deemed the level of scientific evidence for these findings as "well established," which is the highest level achievable.

With such an important and charged issue as abortion, we must be right when declaring a connection or not. We must rely upon data that is free from responder bias. We deserve and have the highest level of evidence from which to draw conclusions. Hence the consensus statements of both the 2003 NCI report and the concurrent American College of Obstetricians and Gynecologists (ACOG) Committee on Gynecologic Practice report rely upon only the most rigorously conducted research. Ethical and political disputes aside, let's hear this good news clearly: "the totality of worldwide epidemiological evidence indicates that pregnancies ending as either spontaneous or induced abortions do not have adverse effects on women's subsequent risk of developing breast cancer."[48]

DOES CHANGING YOUR ANATOMY CAUSE CANCER?

Making changes to your natural anatomy doesn't cause breast cancer, though you might worry it would based on misinformation that trauma (accidental or surgical) upsets the natural state of things.

Let's first talk breast implants: if you have them, should you have regrets too? Whether saline or silicone, above or below your chest muscle, decades old or brand new, textured or smooth, round or shaped, implants do not cause breast cancer.[49] In fact, a study of 3,139 women who got an augmentation between 1953 and 1980 shows that, after an average of 15.5 years, these women have 31 percent *less* breast cancer than would

be expected.[50] And this isn't the only such study. A meta-analysis of seventeen studies also showed a significant decrease in cancer incidence among those with cosmetic implants by one-third.[51] Before you rush out to protect your breasts with implants, the decrease in risk likely corresponds to the facts that women with implants generally have a lower BMI than those without implants, and have their children prior to age thirty, two known factors that decrease breast cancer.[52] That being said, implants can complicate the detection of an *existing* breast cancer, so I do recommend more rigorous screening for those who have them. Generally speaking, women with breast implants in whom breast cancer develops are diagnosed at similar stages and have equivalent survival rates as compared with breast cancer patients without implants.[53]

It's important to note, however, that the World Health Organization has confirmed a probable association between breast implants and the rare development of anaplastic large cell lymphoma (ALCL), a cancer of the immune system, but that is not the breast, and ALCL is not breast cancer.[54] Implant-associated ALCL occurs in approximately 1 per 5,000 women with textured implants (rarely with smooth implants) and presents with fluid forming around the implant an average of eight years after placement. Thankfully, just removing the implant and the capsule that forms around it completely cures 97.5 percent of women. If needed, those affected can receive a targeted antibody-drug called brentuximab; chemotherapy and radiation are rarely indicated.

We also know that while implants don't cause cancer, augmentation and implants after mastectomy can present long-term complications, including changes in nipple or breast sensation, undesirable implant positioning, implant rupture, tight scar tissue around the implant (capsular contracture), or persistent pain.

On the other end of the spectrum, you should also know that no link exists between breast *reduction* surgery (reduction mammoplasty) and breast cancer. In fact, you may actually see a *decrease* in breast cancer risk. Medical literature supports the notion that breast reduction surgery decreases risk consistently around 30 to 40 percent, with even higher

numbers reported when removing two cup sizes (over six hundred grams) of tissue per breast.[55] By removing additional ducts and lobules that carry the potential to become cancerous, there aren't as many around to cause trouble.[56] Another prevailing theory as to why reductions help suggests that removing fat, i.e., adipose tissue, favorably changes the world where breast cells live, called the microenvironment.[57]

While we're on the topic, you should know that breast size doesn't directly affect risk either; small-breasted women don't have less risk of breast cancer than large-breasted ones. However, there's one connection between breast size and cancer when analyzing the *composition* of your breast tissue.[58] Remember, the more ducts and lobules you have (as opposed to adipose tissue), the more cells you possess that can become cancerous. To demonstrate, a prospective study compared self-reported bra size and cancer risk among of 88,826 premenopausal women followed for eight years. [59] They held a number of factors constant so as to isolate the effect of breast size. After stratification by body mass index (BMI), they found a significant trend for increasing bra cup size and greater breast cancer risk in one and only one group—the leaner women. Among overweight or obese women, no association between bra cup size and breast cancer was found.

In other words, leaner women with generous breasts have more breast cancer precisely because they have very little fat, and therefore, a lot more glandular tissue. More glandular tissue simply equals more breast cancer risk. In this group of 420 leaner women with breast cancer, 96 percent wore smaller than a D-cup, so the subgroup of large-breasted lean women at risk due to size alone is small. The vast majority of large breasts are large because of all the fat surrounding the glandular tissue (and as stated, this fat is very unlikely to become cancerous). Conversely, small breasts generally have less fat, and potentially have the same net volume of glandular tissue as many larger breasts. Therefore, in the final analysis, women should have a similar incidence of breast cancer risk irrespective of their breast volume. The majority of studies attempting to correlate size to risk conclude that no such association exists.[60]

ACHOO! CAN YOU "CATCH" BREAST CANCER?

Wondering if you can catch breast cancer or give it to someone else—whether it's by breathing it through the air, or from exposure to bodily fluids such as breast milk, blood and saliva, or from sharing utensils, kissing, or having sex—might at first seem ridiculous. But this is actually a real question I'm asked. So here's your real answer.

When the DNA within a breast cell mutates, that cell starts to grow and divide and spread without control or order; that's how cancer happens. And that's the only way it starts. Exposure to someone else's mutated breast cell doesn't do anything to your own cells' DNA. Yet several studies have shown that many people believe breast cancer to be contagious; these findings suggest a pressing need to develop breast cancer educational programs.[61]

What's encouraging is that in 1964, 20 percent of residents interviewed in Perth, Australia, believed that cancer is contagious; however, when that same interview was repeated forty years later, only 3 percent expressed that same belief.[62] In other words, improved education about health issues can impact beliefs. We need effective community-based interventions that target the demographics most vulnerable to these faulty myths, which tend to be recent immigrants and those of lower socioeconomic status. Busting myths can change behavior, and in turn, improve cancer outcomes.

SEND ME YOUR BREAST MYTHS!

Heard of another myth and you just can't figure out the truth? I want to hear about it! Head on over to pinklotus.com/breastmyths and tell me more. I choose the best myth submissions and debunk them for you on our Pink Lotus Power Up blog.