LONGEVITYrx

The Future of Breast Screening

A Scientific and Moral Justification for QT Imaging
Science, Safety, and Data Support a New Standard of Care

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INTRODUCTION

Hello, we're your Longevity Doctors.

Joel Fuhrman, M.D. is a board-certified family physician and nutritional researcher who specializes in preventing and reversing disease through nutritional and natural methods. He is the father of the Nutritarian diet, a nutrient-dense, plant-rich eating, designed to slow aging, prevent and reverse disease and extend lifespan. Dr. Fuhrman is the president of the Nutritional Research Foundation, the host of five PBS television specials, and the author of 12 books, seven of which had become New York Times bestsellers, including Eat to Live, The End of Dieting, The End of Heart Disease, The End of Diabetes, Super Immunity, The Eat to Live Cookbook, and his latest book, Eat for Life. Dr. Fuhrman. To learn more visit DrFuhrman.com, a great resource to get help and make healthful eating easy and delicious. And don't miss his Eat to Live Podcast.

Cara Fuhrman, N.D.
Cara Fuhrman, N.D. is a licensed naturopathic doctor specializing in women's health, breast cancer prevention, and longevity. Trained in lifestyle medicine and advanced diagnostics, she translates complex science into clear, practical steps patients can follow.

Dr. Cara designs personalized prevention plans, spanning nutrition, biomarkers, and targeted therapies—to optimize hormones and metabolism. Her compassionate care helps patients feel confident taking control of their long-term health.

Breast Screening: What Every Woman Deserves to Know

For most women, a mammogram is simply what you do. Your doctor recommends it, you schedule it, and you hope for good news. Few questions are asked — and fewer still are answered.
But what if the screening tool you've been trusting for decades has significant, well-documented limitations that your doctor may not have mentioned? What if the science points toward something better?

This booklet was written for the woman who wants the full picture. Not a sales pitch, not reassurance — just the evidence, clearly explained.

We'll examine what decades of research actually show about current breast screening methods: where they succeed, where they fall short, and why some of the world's leading researchers have been calling for a new standard of care. We'll also look at what nutritional science tells us about breast cancer prevention — findings that are remarkably consistent, yet remarkably absent from mainstream medical conversation.

And we'll introduce an emerging imaging technology that is quietly changing what's possible in breast health — one that deserves to be part of every woman's informed decision.
You deserve to make that decision with complete information. That's what this booklet is for.

Cara Fuhrman, N.D. and Joel Fuhrman, M.D.

CHAPTER 1

How Effective Are Mammograms At Saving Lives?

For decades, the medical establishment has promoted the narrative that annual mammograms are the most effective way to save women's lives from breast cancer. Yet a closer look at the underlying physics of X-ray screening reveals a technology that, despite major advances in medical imaging, remains fundamentally limited. It's not that mammograms "don't work." Mammography machines are extremely good at detecting abnormalities and early-stage lesions in breast tissue. The problem is that they cannot reliably determine what those abnormalities actually represent. A shadow on an image may be an aggressive cancer—or it may be a slow-growing lesion that would never cause harm. Because the mammography machine cannot make that distinction, detection often sets off a cascade of biopsies, diagnoses, and treatments. For many women, that cascade becomes a source of profound stress, unnecessary medical intervention, and in some cases, deeply tragic consequences.

It has been drummed into women that mammograms save lives by public health authorities and their doctors. This ongoing and consistent messaging has created a near-unquestioned belief with the vast majority of women trusting the power of mammograms to save their lives—often with unrealistic expectations and beliefs not born out by a thorough review of the scientific data. For instance, the use of screening mammography has increased steadily over time, yet the number of women dying from aggressive breast cancer has remained largely unchanged. At the same time, this increased screening has significantly increased the number of women diagnosed and needlessly treated for breast abnormalities that are not life-threatening.

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This perspective aligns with a long-standing and rigorous scientific debate. Although public health messaging often highlights the number of breast-cancer deaths prevented, a more comprehensive evaluation of the evidence looks at a broader and more meaningful outcome: whether screening meaningfully extends overall life expectancy. When researchers examine this larger question, using large meta-analyses and independent reviews, the benefit of routine mammography appears considerably more modest than commonly portrayed. When the full balance of outcomes is considered, including overdiagnosis, unnecessary treatment, radiation exposure, and treatment-related complications, several analyses suggest that the net benefit of mammography is more marginal than commonly portrayed—and that for many and maybe most women, the "harms" may indeed outweigh the "gains."

For example, the Nordic Cochrane Centre analyzed the results of several large mammography screening trials involving about 600,000 women. In these studies, some women were invited to have regular mammograms while others were not. Researchers then followed the women for about 13 years to see whether screening actually helped women live longer.

There were more people diagnosed with cancer in the cohort of people who had mammograms than the people who had no screening. This seems like an obvious conclusion and it is. However, with this increase in diagnosis, the result wasn't that it saved more lives. It did slightly reduce the number of deaths attributed to breast cancer, but the total number of deaths from all causes was essentially the same in both groups. So why were there more cancers found in the group screen, but no fewer deaths? This seems like a paradox, but understandable when considering the entire picture.

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Doctors often use a metaphor to describe different types of cancer: Birds, Rabbits, and Turtles.

- Birds: Move so fast they've already spread by the time a mammogram sees them.
- Rabbits: Move quickly, but catching them early with a mammogram actually saves lives, this rarely happens.
- Turtles: Move so slowly (or stay still) that they would never have caused a problem or been felt in a woman's lifetime.

The Swedish trials showed that mammograms are incredibly good at finding Turtles. These women were "diagnosed" with cancer and most frequently treated with surgery or chemo, even though the cancer never would have killed them. This inflated the number of cancer cases in the screened group without changing the death rate.[2]

The Cochrane Review showed similar findings, rejecting that mammograms saved lives overall as they saw the total number of deaths in both groups remained basically the same. This also suggests that the stress and physical toll of unnecessary treatments (overdiagnosis) might offset the benefits of early detection.

Besides the Cochrane Review, widely considered the most rigorous independent evaluation of mammography, the 25-year follow-up of the Canadian National Breast Screening Study also showed that even though mammography caught more (and smaller) tumors, the death rate in the screened group was virtually identical to the unscreened group.[3]

To make these findings easier to understand, the researchers translated the findings into a practical example. They estimated that if 2,000 women undergo regular mammography screening for about 10 years, one woman will avoid dying from breast cancer. However, around 10 healthy women will be diagnosed and treated for cancers that would never have become dangerous or life threatening, exposing them to surgery, radiation, or chemotherapy they likely never needed. In addition, 200 women experience a "false alarm," leading to significant psychological distress.[4]

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These numbers reveal an uncomfortable reality: in order to potentially extend the life of one woman with breast cancer, many other women must endure the physical and emotional consequences of a diagnosis and treatment they never truly needed. For those women, the screening meant to protect them instead becomes the beginning of unnecessary medical intervention that can profoundly harm their lives in profound ways.

The issue, or one can say, “problem” is that we aren't yet good at telling which "cancers" or pre-cancerous abnormalities in the breast are dangerous and which ones could have been left alone with no consequence. This lack results in overdiagnosis and overtreatment is hurting lots of women.

All-Cause Mortality, Age at Death, and Quality of Life are all critical factors to consider when advising screening and coming to any decisions or conclusions. A woman may survive the cancer diagnosis only to face health problems created by the very treatments meant to save her. The uncomfortable reality is breast cancer itself is not always the only threat to a woman’s life. In some cases, the treatments used to combat it can become dangers in their own right. These interventions are often lifesaving when used appropriately for aggressive cancers, but when applied to cancers that were slow-growing or unlikely to cause harm, the consequences can be profound.

So focusing narrowly on deaths caused by breast cancer ignores the reality of the consequences of treatment. When the full picture is considered, including all-cause mortality, the narrative of “lives saved” becomes far less convincing.[5] We are not saving lives; we are trading one cause of death for another while destroying the quality of life for too many women in the process.

This is not the only problem. It is also a fact that the radiation exposure from the mammogram itself can be a contributory cause of breast cancer.[6] Why would we screen for breast cancer with a technology that causes cancer? This is especially a problem with dense breasts, because when a woman’s breasts are dense, the mammogram is more inaccurate and dense breasts also soak up more radiation.[7]

The industry markets 3D Tomosynthesis (DBT) as a solution to dense breast tissue, but this is a scientific deception.

“DBT” stands for Digital Breast Tomosynthesis, which is more commonly known as a 3D Mammogram.

- Digital: The images are captured electronically rather than on film.
- Breast: The specific area of the body being imaged.
- Tomosynthesis: From the Greek words tomos (slice) and synthesis (putting together). It describes the process of taking multiple X-ray "slices" and combining them into a 3D reconstruction.

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To understand why mammograms are inadequate as a diagnostic tool, one must understand what makes up breast tissue and how x-rays work. Mammograms rely on X-ray attenuation, which is how much X-rays are absorbed by tissues. Breasts are made of three main types of tissue:

1. **Fatty tissue -** This is soft tissue that fills much of the breast. On a mammogram, fat appears dark or gray, which makes abnormalities easier to see.
2. **Glandular tissue -** These are the milk-producing glands (lobules) and milk ducts that carry milk to the nipple. This tissue is naturally firm and appears white on a mammogram.
3. **Fibrous connective tissue -** This supportive tissue holds the breast structure together. It also appears white on a mammogram.

When a woman has more glandular and fibrous tissue than fat, her breasts are classified as dense. Density matters for mammograms because tumors also appear white on a mammogram. Since fatty tissue appears dark, when the breast contains more fat, cancers can stand out clearly against the darker background. But when the breast contains a lot of glandular tissue, the image becomes white-on-white, which can make abnormalities harder to see. Researchers refer to this as the “masking effect.” Because both glandular tissue and tumors appear white on a mammogram, a cancer can easily be hidden within dense tissue and simply blend into the background.

This is why many experts say that mammography works best in fatty breasts and becomes progressively less reliable as breast density increases.

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One of the clearest signs of this limitation is the occurrence of interval cancers. These are cancers that appear between scheduled mammograms, often within one or two years after a woman has been told her screening was normal. Most often these cancers were present at the time of the earlier mammogram, but were hidden by dense tissue. When they are finally discovered—often because a woman feels a lump or develops symptoms—they may already be larger or more advanced.
Studies have found that women with dense breasts are significantly more likely to develop interval cancers than women with fatty breasts. Research confirms these difficulties in detecting cancer in dense breasts. In fatty breasts, mammography can detect around 85–98% of cancers. In women with very dense breasts, detection rates can fall dramatically—sometimes to around 30–50%.[8-10] In other words, a large proportion of cancers may not be visible on the mammogram at all.

This masking problem affects a very large number of women. About 40–50% of women undergoing screening mammography have dense breasts. That means millions of women each year are being screened with an unreliable technology.

Dense breast tissue creates a difficult paradox. On one hand, it makes cancer harder to see on a mammogram. On the other hand, dense tissue itself is associated with a higher risk of developing breast cancer. So the women who may benefit most from effective early detection are often the same women for whom mammography is the least effective.

Current mammograms, like digital mammography, 3D mammography and AI-interpretation can improve detection modestly however, they still rely on the same underlying X-ray density differences. This limitation is rooted in the physics of how mammography images are created, which is why the challenge persists even with the latest machines.

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Radiation Paradox and the "Plane Flight" Deception

Any women who question the potential risk from the radiation are told the radiation is insignificant. The big business of mammogram-centered breast cancer screening is omnipresent with non-profits, governments, and for-profit medical industry all banding together to spread the message that mammograms save lives and that a woman is an idiot if she does not get hers regularly.

One of the most insidious arguments often used by radiologists and advocates of mammogram-based screening is the claim that the radiation exposure is "negligible," frequently compared to the exposure received during a cross-country plane flight. This comparison is a dangerous oversimplification. A plane flight provides low-level background radiation to the whole body. A mammogram provides concentrated, ionizing radiation directly to the most radiosensitive cells in the body, the fibroglandular tissue (the breast epithelium).

This exposure contributes to "Cumulative Mutational Load." Radiation damage is not a single, isolated event; rather the biological effects accumulate. Each exposure has the potential to produce DNA injury, including double-strand breaks, which are among the most serious forms of genetic damage. Over repeated exposures, mutations accumulate in breast epithelial cells.

This becomes even more relevant for women with dense breasts—who often require "extra views", repeat scans or diagnostic callbacks, increasing overall radiation exposure. Dense breasts absorb more radiation and they are damaged more from the radiation. Over decades of screening, often beginning in a woman's forties and continuing for thirty years or more, the cumulative radiation dose can gradually add to the mutational burden in these cells. For many women, the screening itself becomes the very carcinogen that triggers the disease.

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For young women (under 40) or those with genetic predispositions, repeated radiation exposure is counter-intuitive and potentially harmful, as it can trigger the very mutations doctors are looking for. Other interesting facts:

- Higher Power Needed: In dense breasts (Type C or D), X-ray photons are absorbed more easily by the tissue. Radiologists often have to increase the "tube voltage" or take multiple extra views (spot compression) to see through the density.

- DNA Repair Exhaustion: Chronic exposure can lead to "genomic instability." Dr. Klock (founder and inventor of QT imaging) argues that for a subset of women (especially those with BRCA mutations or dense tissue), the repeated "insult" to the DNA can eventually trigger the malignant transformation the test is supposed to find.

- Diagnostic Callbacks and Biopsies: 10–12% of women are called back for more images, and many biopsies are performed under stereotactic (X-ray) guidance, adding significantly more radiation to the same spot.

- Radiation-Induced Cancer: For every 100,000 women screened annually from age 40 to 74, models estimate roughly 125 induced breast cancers and 16 deaths caused by the screening radiation itself.[6]

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The Problem is the Biopsy

If those issues were not already concerning enough, we have not yet arrived at the most significant problem with breast cancer screening. When a radiologist detects something questionable on a mammogram, it typically triggers a cascade of additional testing, often another diagnostic mammogram, an ultrasound and in some cases an MRI with gadolinium contrast.

When a suspicious area is found on a mammogram or ultrasound, a biopsy is often recommended. During a biopsy, a small sample of breast tissue is removed and sent to a pathologist, a physician who specializes in diagnosing disease by examining tissue under a microscope.

The pathologist prepares extremely thin slices of the tissue, stains them with special dyes, and examines the cells under high magnification. The goal is to determine whether the cells look normal, benign (noncancerous), precancerous, or malignant (cancerous). However, even with careful examination, the microscope can only reveal what the cells look like at that moment, not how they will behave over time inside a living body. A pathologist can identify that cells appear abnormal or cancerous, but cannot reliably determine whether a particular tumor will grow slowly and remain harmless for decades, or even disappear over time, or whether it will become aggressive and life-threatening.[11]

This limitation exists because cancer behavior depends on many biological factors that are not fully visible under the microscope. Two tumor cells that look very similar can behave very differently. One may grow extremely slowly and never spread, while another may progress rapidly and metastasize.

Because a biopsy cannot yet predict with confidence which detected cancers will remain harmless and which will become dangerous, most abnormalities are labeled as cancer and are treated aggressively. As a result, women receive surgery, radiation, or chemotherapy for tumors that might never have threatened their lives. Estimates vary from 30-40%, are being overdiagnosed today, depending on which investigative study you look at.[4, 12-16]

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A biopsy cannot be trusted as an accurate diagnostic tool because it does not measure doubling time (how fast the cells are replicating and growing) so every pre-cancerous or cancerous abnormality gets treated, when a large percent should have been left alone. They lead to hundreds of thousands being diagnosed and treated for breast cancer needlessly.

If a radiologist sees an abnormality in a breast that looks questionable – even if she feels the chance of that being a cancer is 1 in 50, she still refers it on to the next level of investigation to be better visualized and located and then biopsied. A biopsy is often presented as "the final word," but it is deeply subjective. Pathologists frequently disagree on whether a sample is "atypia," DCIS, or invasive cancer. In some studies, the disagreement rate is as high as 20% to 50%. A biopsy is not an objective truth; it is a subjective opinion. Dr. Joann Elmore's research (JAMA) reveals that pathologists disagree on diagnoses up to 20% of the time for DCIS and 50% for atypia.[17] This "diagnostic creep" results in thousands of women being labeled with "cancer" by a single individual's interpretation of a slide.

It is estimated that 30 – 40% of women, who have been given a diagnosis of breast cancer and have to live with the trauma of that diagnosis and the treatments thereafter – could have avoided such stress and damage to their lives. The irony of this is that thousands of women who have received treatments, needlessly, who did not have a life-threatening finding, think that their lives have been saved by mammography screening and modern medicine and they have no idea that they have been frightened, stressed and treated for nothing.

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The Cochrane researchers estimated that for every 1 woman whose life is prolonged (even a small amount) by screening, 10 healthy women become "cancer patients" unnecessarily and undergo treatment they didn't need. They call this the 10:1 ratio. That means more people are harmed than helped.[4]

A growing number of scientists have raised concerns about what they call the “net harm” problem with mammography screening. The idea is simple: while modern medicine has become very good at finding and treating breast cancer, the treatments themselves can place significant stress on a woman’s body. In some cases, the long-term toll of screening and treatment may offset some of the benefits that early detection is meant to provide. When these exposures are considered together—screening radiation, treatment radiation, and the potential heart effects of chemotherapy—they can place the cardiovascular system under significant long-term strain.

The breast cancer industry causes serious and widespread secondary risks. The main secondary risk is that chronic stress is also a major risk factor for heart disease.[18] The psychological "morbidity" is well-studied—the chronic stress and "patient-hood" identity—has documented physiological impacts on long-term health.

So to understand why the "lives saved" claim by mammogram proponents is a distortion, we look at the All-Cause Mortality data.

- The Offset Effect: If 1,000 women are screened, you might "save" 1 from breast cancer death. However, in that same group, several women may suffer from Radiation-Induced Heart Disease (RIHD) or chemo-related heart failure 10–20 years later.[19, 20]

- Latency Period: Heart damage from breast cancer treatment often has a 10- to 20-year "incubation" period. A woman "cured" of breast cancer at 50 may die of a heart attack at 65 that was set in motion by her treatment.[21-23] Because she didn't die of cancer, the screening program is still marked as a "success," even if her lifespan was shortened.

- The "Patient-Hood" Stress: Frequent false positives (affecting up to 50% of women over 10 years of screening[24]) lead to chronic spikes in cortisol and blood pressure, which are independent drivers of cardiovascular decline, and place a disease-causing stress on the entire female population.

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Intervention	Cardiovascular Impact/Risk
Radiation Therapy (RT)	7.4% increase in major coronary events for every 1 Gray (Gy) of radiation to the heart. For left-sided breast cancer, the heart receives significantly more incidental radiation.[22] The risk of cardiac death increases by roughly 38% compared to those who didn't receive RT.[25]
Chemotherapy (Anthracyclines)	Drugs like Doxorubicin cause irreversible DNA damage to heart muscle cells. This can lead to congestive heart failure (CHF) years later. The risk is dose-dependent and can be 5x higher than other cancer drugs.[26]
Targeted Therapy (Trastuzumab)	While often reversible, this drug causes a significant drop in LVEF (Left Ventricular Ejection Fraction) in up to 10% of patients, essentially weakening the heart's "pump."[27]

The current screening system does not just find cancer; it manufactures anxiety as a product. The "callback" system creates a state of acute medical trauma. The fear generated by a false positive is not "temporary stress"; for many, it leads to lasting immune suppression and a "death-anxiety" that negatively impacts overall metabolic health. Because the system is terrified of "missing" something, due to legal liability, it defaults to invasive biopsies. This leads to the overdiagnosis of things like DCIS (Ductal Carcinoma In Situ)—lesions that, in many cases, would never have progressed to life-threatening disease.

When pathologists diagnose Ductal Carcinoma In Situ (DCIS)—often described as a very early form of breast cancer—later reviews by panels of expert pathologists have confirmed the original diagnosis only about 84% of the time. This means nearly **1 in 5 women** diagnosed with DCIS may be over-diagnosed or "upstaged" from a benign condition (one that is harmless).[17]

Pathologists operate under "diagnostic creep." To avoid the legal and professional risk of underdiagnosing a potential cancer, they tend to lean toward the more aggressive diagnosis. This "better safe than sorry" approach effectively turns thousands of healthy women into "cancer patients."

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Dr. H. Gilbert Welch (Dartmouth Institute)

Dr. Welch is perhaps the most famous critic of "early detection at all costs." In his landmark study published in the New England Journal of Medicine, he found a widespread and serious imbalance. Since the start of widespread mammography, the detection of small, early-stage tumors has increased by 162 cases of breast cancer per 100,000 women, but the detection of late-stage, dangerous tumors has barely budged.[1] His conclusion suggests that the majority of "cancers" found by mammograms were never destined to become life-threatening. Dr. Welch argues that millions of women are treated with "slash, burn, and poison" (surgery, radiation, chemo) for tumors that would have stayed dormant forever.

The Lead-Time Bias: Many besides Dr. H. Gilbert Welch argue that mammograms don't actually save more lives; they just find cancer sooner, making it look like the patient lived longer, when they rarely do. In reality, the 30-year data collected shows we are finding 162 more "early stage" cancers (mostly overdiagnosis) for every 100,000 women screened without a significant drop in the number of women presenting with late-stage, incurable disease. This means if the cancer was detected 5 years earlier it looked like the patient lived 15 years with cancer, compared to a patient diagnosed 5 years later, without screening which then lived 10 more years. There was no real lifespan benefit, no difference in outcome from a later diagnosis, it just looks and feels like the screening worked, because the patient lived 15 years after the diagnosis. So the patient lived 15 years with breast cancer, instead of 10 years with breast cancer, but her life was not extended by 5 years from screening as those making such claims imply.[1]

Cochrane researchers uncovered a troubling pattern in breast cancer screening studies. Deaths are often reported in a way that makes screening appear more beneficial than it may actually be. In some trials, when women in the screened group died, the cause of death was more likely to be recorded as something other than breast cancer, such as heart disease, while deaths in the unscreened group were more likely to be attributed to cancer.

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To avoid this kind of bias, the Cochrane researchers focused on a more straightforward question: do women who get mammograms actually live longer? When they looked at overall death rates from all causes combined, they found no meaningful difference between women who were screened and those who were not. In other words, the screened group did not live longer—they simply tended to die of different causes.

The "overtreatment" issue is further complicated because doctors cannot currently distinguish between DCIS that is harmless (will never progress) and DCIS that is a precursor to invasive cancer. Because of this uncertainty, the vast majority of cases of DCIS (over 95%) are treated as if they will eventually become life-threatening.[28]

Most experts agree that a significant portion of DCIS cases are overtreated. Plus, treatment radiation to the left breast has been linked to increased risk of ischemic heart disease.

Studies suggest that between 50% and 80% of DCIS cases might never turn into invasive cancer during a woman's lifetime.[29] That is called the “Indolent” factor. Despite being "Stage 0" (non-invasive), the standard treatment often includes surgery (lumpectomy or mastectomy), radiation, and five years of hormone therapy. Even though we treat 60,000 cases of DCIS annually in the U.S., we haven't seen a corresponding drop in the rate of invasive breast cancers. This suggests we are treating many cases that were never going to "graduate" to invasive disease.

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New Shifts in 2025–2026

The medical community is beginning to rethink its long-standing "treat it immediately" approach to ductal carcinoma in situ (DCIS), a condition often labeled as the earliest form of breast cancer. For years, the automatic response was surgery—often followed by radiation. But new research is challenging that reflex. Recent clinical trials, including COMET and LORD,[30, 31] are asking a simple question: what if some of these lesions do not need aggressive treatment right away? Early results suggest that for certain low-risk forms of DCIS—those that grow slowly and respond to hormones—careful monitoring with regular imaging may be just as safe as immediate surgery, at least in the short term. In other words, for some women, doctors may be able to watch the condition closely rather than rush into treatment.

Scientists are also beginning to use genomic testing to better understand how these abnormal cells behave. Tests such as Oncotype DX DCIS and DCISionRT analyze the genetic activity inside the cells—almost like reading their "personality." If the score suggests the cells are unlikely to behave aggressively, a woman may be able to skip radiation after surgery, avoiding weeks of treatment and its side effects. This shift toward less aggressive treatment, sometimes called "de-escalation", is becoming especially important for older women. Medical guidelines are increasingly cautious about recommending surgery or radiation for women over 70 who have other health concerns, because slow-growing DCIS is unlikely to cause harm before other conditions would.

At the same time, major medical organizations such as the American Cancer Society still recommend screening mammography. But there has been a noticeable shift toward "informed decision-making." Instead of assuming screening is always the obvious choice, doctors are encouraged to explain the full picture, including the possibility of overdiagnosis, unnecessary treatment, and the emotional stress caused by false alarms, before women begin routine screening.

Yet despite this growing acknowledgment of the risks, the public message often remains unchanged. Women are still strongly encouraged—sometimes with considerable social pressure—to get their yearly mammograms, even as the medical community itself quietly debates how much benefit those screenings truly provide and how many women may be harmed in the process.

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Chemotherapy is Overprescribed

When a pathologist "over-calls" a diagnosis out of a fear of litigation, the woman is often funneled into radiation, surgery and chemotherapy. Research analyses have shown that for "garden-variety" post-menopausal breast cancers, (invasive ductal carcinoma and invasive lobular carcinoma) chemotherapy offers a survival benefit of as little as 2% to 3% in women aged 50-69.[32] It is amazing that the public perception is the chemotherapy is life-saving, yet this is not true. Only in more aggressive cancers, which are not common, such as pre-menopausal, triple-negative (TNBC) breast cancers where chemotherapy has been shown to be lifespan enhancing.

The most common forms of breast cancer are those that occur after menopause and are driven by estrogen, such as, invasive ductal carcinoma and invasive lobular carcinoma. For these cancers, chemotherapy is relatively ineffective. Even more striking, recent research shows that this remains true, even when the cancer has spread to nearby lymphnodes or metastasized. Traditionally this triggered automatic chemotherapy. A major study called RxPONDER Trial (2020-2021)studied this exact question; it specifically addressed the question of chemotherapy in node-positive patients. It found that postmenopausal women with HR-positive, HER2-negative breast cancer and 1 to 3 positive lymph nodes did not benefit from adding chemotherapy to their endocrine (estrogen-blocking) therapy.[33]

The reason chemo has little benefits in these more common breast cancers is that like prostate cancer, they are growing slowly. When a cancer cell replicates rapidly it unravels its DNA during replication and is more susceptible then to the poisonous effects of chemo. The more dangerous, more aggressive cancer (usually pre-menopausal) are more life threatening, faster growing, but more sensitive to chemotherapy.

Pretty shocking that so many women are getting treatments that do not help. This means thousands of women are suffering through the toxicity of chemotherapy for a benefit that is statistically negligible. It is this overdiagnosis followed by over treatment, that tortures our population and our loved ones. They not only live with fear, disease, and pain, often needlessly—but this does not have to happen anymore – there is a better way.

CHAPTER 2

Meet QT Imaging // Changing the Playing Field

QT Imaging is a new generation technology that represents a fundamentally different approach to breast imaging. Rather than relying on X-ray shadows, QT Imaging measures several physical properties of breast tissue, including the speed of sound traveling through tissue, acoustic attenuation and reflection patterns. These measurements help create a three-dimensional map of the breast's internal tissue structure, providing information about what the tissue is made of.

The resulting dataset can help distinguish between fat, glandular tissue, cysts, and solid tumors, and can also provide clues about the biological characteristics of a lesion. Importantly, QT imaging performs this mapping **without exposing the breast to ionizing radiation and without requiring contrast dyes (used in MRI screening),** making it a non-toxic imaging approach. Because the QT image can more accurately identify abnormalities that are non-life threatening, it has the potential to reduce the number of women requiring biopsies by more than half.

What is interesting is how the technology evaluates a suspicious area. Traditional imaging gives doctors a single snapshot—a static picture—of the breast. When something unusual appears in that picture, doctors often recommend a biopsy simply to be safe. QT Imaging, however, can track how an abnormal area changes over time. By measuring whether a spot is growing quickly or barely changing at all—essentially observing its growth rate or doubling time—doctors can better distinguish between slow-growing or harmless abnormalities and those that are truly aggressive. This approach can allow many women to avoid an immediate biopsy while still identifying the lesions that genuinely require treatment. QT imaging can effectively separate slowly-growing or benign lesions from aggressive ones, without a biopsy.

Unlike an X-ray creating a flat "shadow" QT creates a 3D volumetric map with 40 times the resolution of an MRI, without the need for the toxic contrast dye.

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Feature	3D Tomosynthesis (DBT)	QT Imaging (Acoustic CT)
Energy Mechanism	**Ionizing Radiation:** Uses X-ray photons that can damage DNA.	**Sound Waves:** Uses ultra-low frequency transmitted and reflected sound.
Image Resolution	**Sub-millimeter:** Good, but limited by tissue "shadowing."	**True 3D:** Claims **40x the resolution of MRI** and higher fidelity than DBT.
Data Type	**Qualitative:** A "picture" that a human must interpret visually.	**Quantitative:** Measures the **Speed of Sound (SoS)** as a hard biomarker.
Dense Tissue	**Improvement over 2D:** Better, but still misses up to 10% of cancers in dense breasts.[34]	**Unfazed by Density:** Sound speed is not blocked by dense tissue; it sees "through" it clearly.
Recall Rate	**Reduced from 2D:** But still results in many "callbacks" for non-cancerous findings.	**Significantly Lower:** Studies show a **16% improvement** in non-cancer recall rates over mammography.[35]

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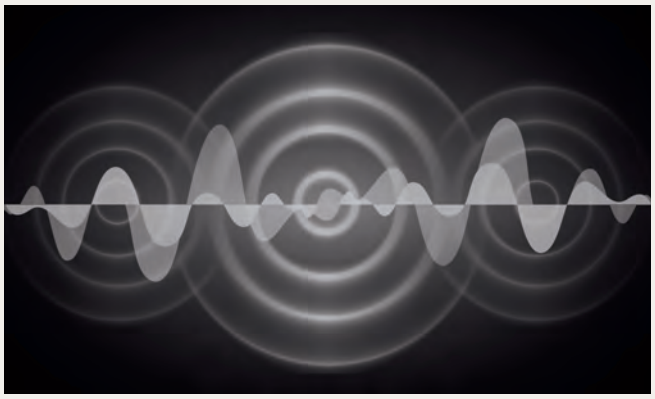
The "Speed of Sound" (SoS) Advantage

Cancer cells have a higher water content and different protein structures, which makes sound travel through them at a different speed than fat or glandular tissue giving cancer cells a “fingerprint”.

T**he Power of Sound Speed (SoS)** readings from QT Imaging uses low-frequency sound waves. Unlike standard ultrasound (which only uses "reflection"), QT Imaging uses transmission ultrasound. Sound waves pass entirely through the breast tissue and are received on the other side. This allows the computer to calculate the "speed of sound" through different tissues (fat, glands, tumors), creating a true 3D volumetric map. Instead of looking at a "picture," QT measures the physical properties of tissue. Malignant tumors are stiffer and have a higher Speed of Sound. This allows for 92-93% accuracy in distinguishing a harmless cyst from a solid mass without a needle.[36]

QT imagining utilizes 248 cameras that rotate around the breast while it dangles in a pool of body temperature water. This creates over 1 billion image points allowing the software to recreate a true 3-D anatomical imaging not a sliced base image. While a radiologist looks at a 3D mammogram and makes an educated guess based on "whiteness," QT provides a numerical value for the tissue's stiffness and density.



The Missed 84%: In technical trials, X-ray mammography was shown to miss a staggering amount of abnormalities in dense tissue that QT Imaging identified clearly. By relying on an "outdated" shadow-based system, the industry knowingly accepts a high failure rate for half the female population.

The "FDA Clearance" Distinction: A provocative point Dr. Klock (the founder, inventor of QT) often makes is that mammography was "grandfathered in" and never underwent the modern, rigorous FDA clearance process required of new technologies today. He uses this to challenge the idea that mammography is the "gold standard" by merit.

QT Imaging (Acoustic CT) represents the first true leap forward in breast health in fifty years. It replaces the "visual opinion" of a radiologist looking at a shadow with the quantitative precision of physics. It has shown a 17% improvement in detecting cysts and a 68% reduction in unnecessary recalls compared to mammography.[35]

Chapter 2: Meet QT Imaging // Changing the Playing Field

Automated and Objective: Standard ultrasounds are "operator-dependent" (quality depends on the technician). QT is fully automated and robotic, ensuring a consistent 3D reconstruction every time. Unlike mammograms and even MRIs, QT can identify abnormalities at a cellular level, often before they form a mass large enough to be seen on a standard X-ray.

Humane Experience: The procedure involves lying prone on a table with the breast submerged in a warm water bath for about 10–20 minutes. There is no pain, no "squishing," and no skin-to-machine contact.

The Power of Doubling Time: Because QT is robotic and perfectly reproducible, it allows for Volumetric AI tracking.[37] By scanning a woman 4 to 6 months apart, the system can even calculate the exact volumetric size of an irregularly shaped mass and compare that size with extreme accuracy to a repeat scan a few months later. With that data in hand the equipment calculates the exact growth rate and doubling time. Once you know if a mass is not growing, growing slowly or growing rapidly, you know if it has potential for harm or not.

If a mass has a slow or zero doubling time, it is biologically "indolent." We can monitor it safely with zero-radiation QT scans, effectively preventing the "needless biopsy" that starts the cascade toward unnecessary treatment. Using QT Imaging's volumetric AI to track growth over 4–6 months creates a "biological filter": Many findings on a mammogram are indolent lesions with a doubling time of several years (or zero growth). If the AI confirms no growth over a 120-day interval, the clinical need for a biopsy vanishes.

The "Rabbits": Only lesions showing a rapid, aggressive doubling time would trigger an immediate biopsy.

By filtering out the "Turtles" and "Cysts" which QT identifies with accuracy without a needle, the biopsy rate naturally drops by more than half, leaving only the truly suspicious "Rabbits" for invasive testing. Dr. John Klock's internal data from the results of using QT imaging for a decade suggests that "98% of recalls after mammogram for further testing and biopsy are avoidable," and that volumetric tracking can dramatically prune the biopsy pipeline. QT Imaging is the only technology that offers a data-driven exit from the "Screen-Biopsy-Treat" loop.

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The Mathematical Justification

The "50% reduction" figure is grounded in the current failure rate of traditional screening. Currently, over 80% of breast biopsies performed in the U.S. return as benign. This means 4 out of 5 women are undergoing an invasive surgical procedure for a non-cancerous finding. Research shows QT Imaging has a higher specificity than mammography. In a multi-reader study, QT scans decreased the "non-cancer recall rate" (false positives) by roughly 16% compared to traditional digital mammography.[35] By accurately identifying benign cysts that mammograms often flag as suspicious, QT can theoretically prevent the cascade of "needless treatments"

The "Grey Zone" Target: About half of these "suspicious" findings fall into a low-suspicion category (BI-RADS 4A). Recent AI-stratified studies show that applying growth-rate thresholds can safely avoid 50% to 60% of these biopsies while maintaining nearly 100% sensitivity for true cancer.[38] 10–12% of women are "called back" from mammograms. These callbacks are a massive administrative and financial drain. QT's ability to reduce false positives represents a billion-dollar saving in "wasteful" healthcare. Using AI to track doubling time allows for "Active Surveillance"—a model already used for prostate cancer. This avoids the $5,000 to $10,000 cost of a biopsy and the subsequent "overtreatment" of a non-growing mass.

Tailoring Therapy (The Real Treatment)

If you are looking at a "garden-variety" (ER-positive, HER2-negative) post-menopausal breast cancer, the dilemma is: if the treatment (chemo) is often skipped anyway, why do we need more sophisticated imaging to find it? The logic for why QT imaging—and its ability to measure things like doubling time—still matters falls into a few main categories—

1. Avoiding Surgery, not just Chemo: If a scan identifies a tiny, indolent (slow-growing) mass with a very long doubling time, doctors might move toward "active surveillance" rather than immediate surgery or radiation. Overdiagnosis isn't just about unnecessary chemo; it's about unnecessary lumpectomies and mastectomies.

2. Predicting Aggression: If a tumor has a rapid doubling time, it might be the exception to the "no chemo for post-menopausal" rule. QT helps identify that 10–20% of cases where the cancer is actually aggressive enough to warrant systemic treatment.

3. Monitoring endocrine therapy: Chemo is increasingly sidelined for post-menopausal ER+ cancers, but endocrine therapy (like Letrozole or Tamoxifen) is still the standard. Because QT imaging is radiation-free, it can be used frequently to see if a tumor is shrinking in response to hormone blockers. If the "doubling time" becomes a "halving time," you know the estrogen-blockers and nutritional interventions are working and you can avoid more invasive options. Monitoring the response to therapy whether hormonal or nutritional is the "gold" standard, now that QT imaging can give an accurate volumetric evaluation of an abnormality.

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The bottom line: Even if you skip chemo, knowing exactly what the tumor is doing allows you to potentially skip the surgery, the radiation, and the anxiety of "treating a ghost."

Lastly, this begets the question, is it safe to wait for a few months so a doubling time can be calculated in a suspicious breast mass?

The decision to use a 4–6-month follow-up interval for breast imaging is a calculated clinical strategy designed to balance the risks of overdiagnosis (and unnecessary invasive procedures) against the risks of disease progression.In the context of QT Imaging (an automated transmission ultrasound technology), this approach is within a “safety window” because of the biological behavior of breast cancer and the high sensitivity of the modality.

Because most breast cancers grow relatively slowly, a 4–6 month window (120–180 days) allows for only one "doubling" of volume. In the world of oncology, an increase from 5mm to 6.3mm (a volume doubling) rarely changes the surgical stage or the long-term prognosis. A study in the American Journal of Roentgenology (AJR) noted that for lesions classified as BI-RADS 3 (probably benign), the risk of malignancy is <2%,[39] and the short-term delay does not result in an increased rate of advanced-stage diagnosis.

If a lesion has not changed in 6 months, the probability of it being a cancer, whether slow-growing or aggressive cancer drops significantly, sparing the patient an invasive biopsy. It more likely represents a fibroadenoma, cyst, scar tissue or other benign changes. Because this modality is highly sensitive to the physical properties of tissue, it can detect suspicious changes earlier than mammography in dense breasts.

When a technology has a high Negative Predictive Value (NPV), the "wait and watch" approach becomes statistically safer. If the initial scan was borderline, the second scan acts as a "biological stress test." It is important to note that the 4–6 month "safe" window applies specifically to lesions that do not show "red flag" characteristics (like spiculated margins or high-speed sound clusters). If a lesion is high-risk, a biopsy is performed immediately. The delay is only used for indeterminate findings where the likelihood of cancer is statistically low, yet not zero.

Chapter 2: Meet QT Imaging // Changing the Playing Field

The Billion-Dollar Barrier: Why We Are Stuck

The resistance to QT Imaging is not scientific; it is financial. The reason QT Imaging is not in every hospital is not a lack of science; it is a conflict of interest. Why isn't QT Imaging the standard everywhere? The answer is financial and legal, not scientific.

The Financial Fortress: A "Billion-Dollar Inertia"

The global breast imaging market is currently valued at over $4.4 billion (2024) and is projected to reach $6.6 billion by 2028. This is not just a health system; it is a massive industrial complex. Capital Equipment "Lock-in": A single 3D Tomosynthesis machine costs between $250,000 and $500,000. When a hospital system invests millions into a suite of these machines, they are financially committed to a 7- to 10-year depreciation cycle. They literally cannot afford to pivot to a superior technology like QT Imaging until their current "fleet" has paid for itself through thousands of billable procedures.

- **The Cost of Overdiagnosis:** Research published in Health Affairs estimates that breast cancer overdiagnosis and overtreatment cost the U.S. healthcare system $1.2 billion annually.[34]

- **Institutional Resistance:** Switching to a "Wait and See" model using QT Imaging and AI doubling times threatens the revenue of:

1. **Radiology Centers** (fewer diagnostic mammograms).
2. **Pathology Labs** (fewer biopsies).
3. **Oncology Centers** (fewer chemotherapy infusions).

The "Free" Mammogram Policy: The Affordable Care Act (ACA) mandates that insurance covers annual mammograms at no cost to the patient. While this sounds good, it creates a "monopoly of access." Technologies like QT Imaging often require an out-of-pocket cost because they aren't yet mandated, making the "free" but potentially harmful option the default choice for the masses.

The Legal Shield: Radiologists follow the "Standard of Care" (mammogram + biopsy) not because it is the best for the patient, but because it is the best for their legal defense. If they use a "new" technology like QT and a mistake happens, they are legally vulnerable. This creates a system that chooses "safe" (legal) over "better" (scientific). Following the flawed mammogram-biopsy-chemo protocol protects the doctor legally, even if it harms the patient physically and psychologically. They would rather perform an unnecessary biopsy than take the professional "risk" of monitoring a mass with AI growth tracking.

Note on FDA Status: While QT should be the “gold standard” replacing mammograms as a standalone screening, it is currently FDA-cleared as an adjunct (supplement) to mammography. Most insurance companies do not yet cover it as a primary screening tool, often requiring an out-of-pocket cost (typically around $750).

CHAPTER 3

Proper Nutrition Protects Your Breasts and Your Life

The Best Protection: Micronutrients.

Micronutrients are the vitamins, minerals, antioxidants, and thousands of phytochemicals naturally present in whole plant foods that the body requires in small amounts to support normal cellular function, repair damaged DNA, strengthen the immune system, and protect against chronic diseases.

To significantly reduce the risk of developing cancer—and to help the body defend itself against the growth and spread of cancer—a diet rich in micronutrients is essential. This means adopting a Nutritarian diet, centered on nutrient-dense plant foods that supply powerful protective compounds. This way of eating not only helps lower the likelihood of developing cancer in the first place, but also provides the best chance of preventing recurrence and reducing the risk of metastasis for those who have already been diagnosed. For the greatest protection, this approach should begin as early in life as possible—or immediately—rather than waiting until a cancer diagnosis forces the change.

A Nutritarian diet is designed to maximize the micronutrients one is eating and it does by including the full variety of colorful, natural plants with documented anti-cancer activity. It includes the full portfolio of the foods and nutritional substances that demonstrate in the scientific literature to offer dramatic protection against breast cancer. This is real science that offers powerful protection.

Western diet promotes cancer

High animal protein intake elevates circulating levels of insulin-like growth factor 1 (IGF-1), which promotes cell proliferation, and elevated IGF-1 levels are associated with an increased risk of breast cancer.[41-46] Saturated animal fats promote inflammation, excess heme iron promotes oxidative stress and inflammation, processed meats contain carcinogenic preservatives, and high-temperature cooking of meats forms carcinogens.[47-51]

Consuming high-glycemic refined carbohydrate foods, such as white rice, white bread, baked goods, and conventional desserts, contributes to elevated insulin levels, insulin resistance, and inflammation. Insulin, similar to IGF-1, is a growth-promoting hormone with higher levels linked to increased breast cancer risk.[52-54] Starchy foods dry-cooked at high temperatures (such as French fries, crackers, and potato chips) also produce acrylamide, a cooking-related carcinogen.[55] Excess sugars also trigger inflammation.[56] Lastly, alcohol is metabolized into a carcinogenic compound (acetaldehyde) after ingestion, and even small amounts of alcohol increase breast cancer risk.[57, 58]

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Plant-derived phytochemicals are protective

Plant foods are packed with phytochemicals that help your body fight cancer by reducing oxidative stress and inflammation, protecting DNA, and supporting the immune system.

Some examples are curcumin, flavonoids, and resveratrol, which have anti-inflammatory effects. There are several subclasses of flavonoids: flavones in red peppers, celery, and parsley; flavanols such as quercetin in onions, vegetables, grapes, and berries; flavanones in citrus fruits; isoflavones; flavan-3-ols in tea; and anthocyanins in berries and grapes.[59] Many phytochemicals have anti-proliferative or anti-angiogenic properties, affect the cell cycle, or counteract cell motility, which is relevant to tumor metastasis.[60] Many also activate the body's natural antioxidant and detoxification system (called Nrf2), which helps eliminate toxins and free radicals. including cruciferous-derived isothiocyanates, berry anthocyanins, quercetin, EGCG from green tea, and allicin from garlic.[61-63] Carotenoids and antioxidant vitamins directly attack free radicals. Fiber and resistant starch promote a healthy microbiome, help keep blood glucose down, and help eliminate excess estrogen.[64-68] The gut microbiome breaks down flavonoids into the forms that are absorbed and have anti-cancer effects in the body. [69] Healthy gut bacteria are also of key importance to immune function.[70]

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G-BOMBS: The Anti-Cancer Superfoods

G-BOMBS—Greens, Beans, Onions, Mushrooms, Berries, and Seeds—are the most powerful health-promoting foods. Rich in phytochemicals, fiber, and antioxidants, these daily staples help prevent cancer, support immune function, and aid in sustainable weight loss.

Greens

Leafy greens are the most nutrient-dense of all foods. Green vegetables, including leafy greens, contain lots of protein per calorie, and this plant protein is packaged with beneficial phytochemicals, such as folate (the natural form of folic acid), calcium, and carotenoids.[71]

When a cruciferous vegetable's cell walls are broken by blending, chopping or chewing, a chemical reaction converts glucosinolates to isothiocyanates (ITCs), such as sulforaphane – compounds with a variety of potent anti-cancer effects.[72, 73] Indole-3-carbinol (I3C; found in broccoli, Brussels sprouts and cabbage) may be especially protective against breast cancers because it helps the body excrete estrogen and other hormones.[74-76]

Higher intake of cruciferous vegetables is linked to a reduced risk of many cancers.[77-81] In randomized controlled trials, cancer-related biomarkers have improved with supplementation with cruciferous vegetable extracts (usually broccoli sprout extract).[82-85] For example, in a study of thirty women with premenopausal breast cancer randomly assigned to receive broccoli sprout extract or placebo for two weeks before surgery, gene expression changes favoring tumor cell death and an increase in immune cells infiltrating the tumors were observed in the broccoli sprout extract group.[86]

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While many studies show a steady benefit from eating greens, two particular studies stand out for their "dramatic" benefits for surviving a diagnosis and the other on preventing the most aggressive types of breast cancer.

1. The Shanghai Breast Cancer Survival Study (Up to 62% Reduction in Mortality)
This is arguably the most dramatic study regarding the power of cruciferous vegetables for those who have already been diagnosed. Researchers followed nearly 5,000 breast cancer survivors in China over several years. Women who consumed the highest amounts of cruciferous vegetables (like bok choy, cabbage, and broccoli) had a 62% reduction in the risk of total mortality and a 35% reduction in the risk of cancer recurrence compared to those with the lowest intake. The benefit followed a "dose-response" pattern, meaning the more they ate, the better the protection. The highest consumers averaged about 150 grams per day (roughly 1.5 to 2 cups).[87]

2. The Nurses' Health Study II (ER-Negative Subtype Focus)
While general risk reduction in some Western studies is often cited around 10–15%, a massive, long-term analysis of over 180,000 women (combining the Nurses' Health Study and NHS II) found much more dramatic protection when looking at specific, aggressive cancer types. Women who ate high amounts of cruciferous vegetables (at least 5.5 servings of fruits and vegetables total daily) had a significantly lower risk of ER-negative (estrogen-receptor-negative) tumors—a subtype that is often more difficult to treat. Further analysis presented at the 2025 San Antonio Breast Cancer Symposium indicated that high glucosinolate intake (the active compounds in cruciferous greens) was associated with a roughly 20–23% reduction in risk for these aggressive subtypes, particularly in women with a healthy BMI.[88, 89]

The regular consumption of all types of green vegetables offers significant breast cancer protection, that means both raw vegetables and cooked vegetables and cruciferous greens and non-cruciferous greens.

Cruciferous greens: arugula, bok choy, broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, kale, mustard greens, watercress;

Non-cruciferous greens: asparagus, cucumber, green beans, peas, romaine, spinach, Swiss chard, zucchini

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Beans

Beans support gut health, satiety and stable blood glucose. Higher legume or fiber intake is associated with a reduced risk of several common cancers,[90-99] and fiber facilitates the excretion of estrogens, which contributes to breast cancer prevention.[66-68, 100]

Beans are very high in viscous fiber, which helps reduce cholesterol levels,[101] and they are rich in resistant starch, a prebiotic fiber, which is converted by gut bacteria into short-chain fatty acids (SCFAs) that protect against colon cancer and naturally control hunger and fullness signals.[102] They help to make you feel satisfied after eating and less likely to overeat.

Numerous studies have documented that women who eat beans regularly have lower incidence of breast cancer. The first one of mention is the Nurses' Health Study II (NHS II), The specific finding—that even two servings of legumes per week can significantly lower risk—comes from a 2005 analysis of the Nurses' Health Study II. Women who consumed beans or lentils at least two times per week had a 24% lower risk of developing breast cancer compared to those who ate them less than once a month. This research followed 90,630 premenopausal women (ages 26–46) over an eight-year period.[103]

Beyond the NHS II, several other studies have documented the protective effects of beans and pulses, such as The Four Corners Breast Cancer Study: This study focused on Hispanic and Non-Hispanic White women in the Southwestern U.S. and found that high legume intake was associated with a reduced risk of breast cancer.[104]

San Francisco Bay Area Breast Cancer Study: This study found that a high intake of bean fiber and total beans reduced the risk of breast cancer by roughly 20% to 25%. The inverse association was strongest for ER-PR- (estrogen and progesterone receptor negative) breast cancer, which is a more aggressive subtype.[105]

Nigerian Integrative Epidemiology of Breast Cancer (NIBBLE) Study: A matched case-control study found that high bean intake (>1 portion/week) was associated with a 45% reduction in breast cancer risk among African women.[106]

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Soybeans are especially protective due to their isoflavones, which modulate hormones, estrogen in particular, and reduce the risk of cancers in other ways as well.[107-114] Higher soy intake in women with breast cancer is associated with lower risk of recurrence and a lower risk of death from breast cancer.[115-118]

Beans: adzuki, black beans, cannellini beans, chickpeas, edamame, tempeh, green peas, lentils, kidney beans, navy beans, pinto beans, snow peas, white beans

Onions and garlic

Onions, along with leeks, garlic, chives, shallots, and scallions, make up the Allium family of vegetables. Regular consumption is linked to reduced risk of digestive cancers.[119-128]

Their characteristic organosulfur compounds inhibit tumor cell growth and angiogenesis, among other anti-cancer activities.[124, 129] Like ITCs, these compounds are released when onions and garlic are chopped, crushed or chewed. Wait 10 minutes to cook after chopping to maximize production of protective compounds.[130]

Randomized controlled trials on raw garlic consumption have found improvements in blood pressure, antioxidant enzyme activity, and blood glucose, as well as reduced DNA damage.[131] Garlic supplementation may be beneficial for prevention for those at risk of several cancers.[129, 132]

Large-scale studies have looked at general garlic and onion consumption and found a significant reduction in breast cancer risk. The Puerto Rico Study (2019): This is one of the most cited recent studies. Researchers found that women who consumed sofrito (a staple condiment made primarily of onions and garlic) more than once a day had a 67% lower risk of breast cancer compared to those who never ate it.[133] The French Case-Control Study: A study in France found that increased garlic and onion consumption was associated with a statistically significant reduction in breast cancer risk.[134] NCI & WHO Guidelines: The World Health Organization (WHO) and the National Cancer Institute (NCI) acknowledge garlic's potential. The WHO specifically lists 0.4 to 1.2 grams of dried garlic powder (which includes granules) as a recommended daily dose for general health promotion, roughly equivalent to one fresh clove.

These Allium vegetables include: chives, garlic, leeks, onions, scallions, shallots

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Mushrooms

Mushrooms provide beta-glucans and other compounds that promote immune cell function, inhibit cancer cell growth and other cancer-related processes, and suppress production of estrogen. White button and portobello mushrooms contain the highest levels aromatase inhibitors – compounds that can block the production of estrogen.[135] Regular consumption of mushrooms is associated with reduced cancer risk, especially breast cancer.[136–143] High-dose, concentrated mushroom extracts may help to reduce the immunosuppressive effects of chemotherapy, according to some clinical trials.[144–152]

The scientific literature on mushrooms and breast cancer includes several "dramatic" findings, particularly from large-scale case-control studies in Asia. Two of the most frequently cited and striking studies are summarized below:

1. The "Joint Effect" Study (64%–89% Reduction)

This 2009 study of over 2,000 Chinese women is often considered the most dramatic because it measured the additive effect of mushrooms and green tea. The Finding: Women who consumed at least 10 grams of fresh mushrooms daily (about half a single white button mushroom) had a 64% lower risk of breast cancer compared to non-consumers. But the most surprising and interesting part of this study was the "Synergy" Effect: When women combined high mushroom intake with drinking green tea regularly, their risk of breast cancer dropped by nearly 90%.[153]

2. The Korean Postmenopausal Study (84% Reduction)

While many studies focus on premenopausal women, this 2008 study found an incredibly high level of protection for postmenopausal women specifically. Postmenopausal women with the highest mushroom intake (averaging around 10g/day) had an 84% lower risk of breast cancer compared to those with the lowest intake. The researchers noted that mushrooms act as natural aromatase inhibitors, which are substances that block the production of estrogen—the primary driver of many postmenopausal breast cancers.[154]

Since several types of raw mushrooms contain a potentially harmful substance called agaritine, mushrooms should be eaten cooked to reduce agaritine content.[155, 156]

Mushrooms: chanterelle, cremini, maitake, oyster, porcini, portobello, Reishi, shiitake, white button

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Berries

Berries are rich in antioxidants, such as flavonoids and ellagic acid, and fiber. These phytochemicals protect DNA, reduce inflammation, activate the body's antioxidant enzymes, and inhibit cancer cell growth and tumor angiogenesis. Regular berry intake is linked to lower risks of cancer and cognitive decline.[157-166]

Studies on black raspberry gel or powder in patients with oral or esophageal precancers found regression of those precancerous lesions or a reduction in cell proliferation or pro-inflammatory gene expression. [167] In colorectal cancers, black raspberry powder induced changes in gene expression favoring tumor cell death, and increased expression of tumor suppressor genes.[168]

The benefits of berries are pretty dramatic too.Let's first review a landmark study from the City of Hope, and the second is a comprehensive 2023-2024 meta-analysis on the most difficult-to-treat form of breast cancer.

1. The "Triple-Threat" Blueberry Study (City of Hope)

This is widely considered the most dramatic demonstration of berries' potential against Triple-Negative Breast Cancer (TNBC), which is typically the most aggressive and hardest to treat. Researchers found that blueberry intake could reduce tumor volume by a staggering 60% to 75% in specialized models. It wasn't just that the tumors grew slower; the berries actually inhibited the cancer's ability to metastasize (spread). The study showed a 70% reduction in liver metastases and a significant decrease in lymph node spread. Unlike many studies that use impossible doses, this research calculated that the benefit could be achieved by a human eating about 2 cups of fresh blueberries a day—a perfectly manageable amount. It showed that berries "starve" the tumor by blocking the PI3K/Akt pathway, a major driver of cancer cell survival.[169] Remember wild blueberries and blackberries are even more potent than the regular blueberries studied here.

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2. The 2023-2024 Anthocyanin Meta-Analysis & Aronia Findings

This recent work (published/updated in Frontiers in Oncology and The Journal of Berry Research) synthesized data to show how berry pigments (anthocyanins) act as epigenetic "re-programmers." The research demonstrated that berry compounds don't just kill cells; they actually turn back on tumor-suppressor genes (like PTEN) that the cancer had "silenced."

In studies involving Aronia (Chokeberry) and Black Raspberries, researchers observed a significant decrease in the "mitotic activity index"—essentially, they "turned down the volume" on how fast the cancer cells could divide.

This research is the foundation for the current 2025/2026 human trials. It proved that berry compounds are systemically bioavailable, meaning when you eat them, the protective compounds actually reach the breast tissue in high enough concentrations to alter gene expression and reduce "oxidative stress markers" in the blood.[170, 171]

Berries: blackberries, blueberries, cranberries, elderberry (powder supplements), raspberries, black raspberries, strawberries

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Seeds (and nuts)

Regular consumption of nuts is linked to longevity. Seeds and nuts provide healthy fats and plant sterols that enhance the absorption of carotenoids, benefit cardiovascular health, and help with weight maintenance.[172-175] Flax, chia, and sesame seeds are rich in lignans—plant estrogens with anti-cancer effects.[176-182]

In women diagnosed with breast cancer who were randomly assigned to a placebo or flax-containing muffin for about one month until surgery, there was significant apoptosis (tumor cell death) and reduced tumor cell proliferation in the flaxseed group.[183] In another trial, premenopausal women at high risk of breast cancer were given a lignan supplement daily for one year, and cancer-related biomarkers in breast tissue dramatically improved.[184] A similar study found reduced proliferation markers in tumor cells after six weeks of soybeans and flaxseeds daily.[185] Remember, to get these benefits from seeds the flax and chia seeds have to be ground up.

A good guideline is to have half of your nut and seed intake as high-omega-3 ALA nuts and seeds (flax, chia, and hemp seeds, and walnuts).

Note: Consume raw and with meals to enhance carotenoid absorption. Also, because they are high in calories, don't snack on seeds and nuts.

Seeds & Nuts: walnuts, almonds, chia seeds, flax seeds, hemp seeds, Mediterranean pine nuts, pistachios, pumpkin seeds, sesame seeds, sunflower seeds

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Supplements help, and nutrition aids those with breast cancer.

Recommended supplements for low salt, plant-based diets are adequate B12, zinc, Vitamin D and iodine. Adequate omega-3 fatty acids (EPA and DHA) are also important for dementia protection and longevity in those not eating regular seafood. But the specific supplements or herbs with anti-breast cancer effects include turmeric and curcumins derived from them, EGCG from green tea, and mixed mushroom extracts.

With the advances in nutritional science in conjunction with non-radiation screening and blood tests for cancer, we can now really extend lifespan as we reduce death from breast cancer. Nutritional excellence prevents, but it also slows replication and halts the progression of common breast cancers, supporting lifespan enhancement and recovery in women with slow growing cancers who don't get chemo.

For women who do require chemo with a more aggressive cancer, nutritional excellence is also life-saving because chemo never kills every single abnormal cell. Those abnormal malignant stem cells that escape chemo can grow back and be responsible for a breast cancer death because those are the escaped cells that were not sensitive to chemo to begin with so they are not easy to treat when they reoccur. But it is these stray cells that have not yet multiplied and coalesced into a mass that a health immune response can seek out and destroy. The same foods and supplements that prevent breast cancer can extend survival in those who have breast cancer. The same biological pathways involved in prevention also play a role in improving survival and reducing recurrence for those already diagnosed. Several key studies support the efficacy of this dietary portfolio and these specific supplements in a post-diagnosis setting.

The DIANA-5 Trial: This large trial of over 1,500 women with stage I–III breast cancer found that those with the highest adherence to a Mediterranean-style, plant-rich diet (similar in profile to Nutritarian principles) experienced a 41% reduction in the risk of recurrence compared to those with low adherence.[186]

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Insulin-Like Growth Factor (IGF-1) Reduction: A 2024 study on breast cancer survivors following a whole-food, plant-based diet showed significant reductions in IGF-1 and inflammation markers. Since IGF-1 acts as "fuel" for existing breast cancer cells, lowering it through diet is a primary mechanism for enhancing lifespan.[187, 188]

The Pathways Study: This study evaluated diet quality indices (like the DASH and Mediterranean diets) and found that high-quality, plant-heavy diets were associated with a 21% to 27% lower risk of all-cause mortality in breast cancer survivors.[189]

In addition to those protective foods, the combination of EGCG and Curcumin is often highlighted because they target different pathways of the same cancer cell simultaneously, making it harder for the cancer to adapt.

Inhibiting Cancer Stem Cells (CSCs): Research suggests that EGCG and Curcumin work synergistically to suppress breast cancer stem cells—the specific cells often responsible for recurrence and metastasis. When used together, they inhibited "tumor-sphere formation" (the ability of cancer to grow in 3D) much more effectively than either did alone.[190] EGCG has also been shown to enhance the sensitivity of breast cancer cells to common treatments like Tamoxifen.[191] In laboratory settings, the combination of Curcumin and EGCG induced apoptosis (programmed cell death) even in doxorubicin-resistant breast cancer cells.[192]

Animal models of aggressive breast cancer have shown that a combination of EGCG and Curcumin decreased tumor volume by nearly 50% by suppressing the growth of new blood vessels (angiogenesis) to the tumor via the VEGFR-1 protein suppression.[193]

Chapter 3: Proper Nutrition Protects Your Breasts and Your Life

The mushroom extracts also have data to suggest they are not only preventative, but also helpful for those with cancer. Turkey Tail is the most rigorously studied mushroom for breast cancer. It contains two key polysaccharides: PSK (Polysaccharide-K) and PSP. A systematic review and meta-analysis of 13 clinical trials found that cancer patients taking Turkey Tail (PSK) had a 9% absolute reduction in 5-year mortality.[194] In Japan, PSK is an officially approved adjuvant drug for cancer treatment.

A Phase I study funded by the NIH (at University of Minnesota and Bastyr University) showed that breast cancer patients who took Turkey Tail capsules after completing radiation therapy had a faster recovery of Natural Killer (NK) cell activity and increased CD8+ T-cell counts, which are the body's primary "search and destroy" units for cancer cells. The study found that 6 to 9 grams per day was safe and effective at boosting these immune markers in women with breast cancer.[195]

While White Button Mushrooms (*Agaricus bisporus*) are often seen as a simple culinary mushroom, it is a staple of the Nutritarian diet for a specific reason: Aromatase Inhibition. In a Phase I trial at City of Hope, researchers tested white button mushroom extract in postmenopausal breast cancer survivors. They found that the extract contains phytochemicals (conjugated linoleic acid) that can suppress aromatase activity, the enzyme responsible for producing estrogen in the body. Since many breast cancers are estrogen-receptor positive (ER+), these mushrooms may act as a mild, food-based "natural aromatase inhibitor" to complement drugs like Arimidex or Letrozole.[196]

Reishi is frequently used to improve quality of life and treatment response too. A Cochrane review of five randomized controlled trials found that patients who took Reishi alongside chemo/radiotherapy were 1.27 times more likely to respond positively to the treatment than those who did not. Reishi has been shown to inhibit "epithelial-to-mesenchymal transition" (EMT), a process that cancer cells use to become mobile and spread (metastasize) to other organs.[148]

EPILOGUE

I hope this booklet clarifies and supports you to be more comfortable in making the right decisions regarding your personal health. Regardless of the route you choose, you have the right to be informed and then choose the path you feel most comfortable with. This booklet supplies detailed information about breast cancer screening and breast cancer that you don't typically hear from your doctors. Informed consent is the foundation of proper medical care.

Ultimately doctors can help you with the information you need to feel secure in your decisions about your body, but they should not pressure you or have you feel forced into the path they think is right. Medical care is dynamic and fluid, it changes every year as more information and technology becomes available. Too often doctors have been misinformed and support old-school thoughts and beliefs that they believe strongly but are not fully supported by evidence. Share this booklet with your family, friends and especially your physicians, hopefully more doctors will be on the same page and reduce the confusion.

Our office is located in San Diego. We have QT imaging equipment and highly skilled radiologists to interpret such. We specialize in non-radiation screening (for bone mass too) and then support recovery and healing using non-toxic, natural modalities, lifestyle medicine and regenerative methods. We don't take the place of your breast surgeon, or oncologist, but working with us and learning more about nutritional excellence and regenerative technology to prevent disease, aid recovery and resolve pain has the potential to add many quality years to your life. For more information see DrLongevityRx.com

And visit DrFuhrman.com For more information about diet, supplements, menus, recipes and support. My latest book with over 2000 scientific references is Eat for Life.

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