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## AS WE SEE IT

### Lethal Danger of CT Scans

By William Faloon



We tried everything... from *pleading* with arrogant physicians to providing *irrefutable* documentation to support our position. The response was always the same: we were “*out of our minds*” for suggesting that medical X-rays increase future **cancer** risks.

Our opposition could never substantiate that exposing healthy cells to ionizing radiation was safe. They did at one point rely on the **Atomic Energy Commission**, who claimed there were no dangers to low-level radiation exposure.



William Faloon

The **Atomic Energy Commission** was created to “manage the development, use, and control of atomic (nuclear) energy for military and civilian applications.” Like so many federal agencies, the priority was not to protect the public’s health. Instead this tax-funded bureaucracy (like the FDA) functioned to guarantee the economic success of the industries it regulated.<sup>1</sup>

By ridiculing those who warned about the carcinogenic effects of X-rays, the federal government and medical establishment enabled companies making CT scanners (and other radiation devices) to earn **tens of billions of dollars** in profit, with Medicare and private health insurance picking up most of the costs.

#### RADIATION OVERLOAD

Compared to regular medical X-rays, CT scans yield much higher-resolution images. Unfortunately, CT scans also expose the patient to hundreds and sometimes thousands of times more radiation.<sup>2-4</sup>

The routine use of CT scans and other dangerous X-ray imaging procedures has *skyrocketed* over the past three decades. In **1980**, there were **3 million** CT scans done. By the year **2007**, the number increased to about **70 million**.<sup>5,6</sup>

We at **Life Extension®** long ago warned members to avoid CT scans and any kind of X-ray unless absolutely necessary. Up against us was an armada of for-profit companies who promoted CT scans to *healthy* people to measure **coronary artery** calcification, *virtual colonoscopy* in place of the more effective standard colonoscopy (flexible tube procedures), and even *whole-body* CT scans to identify abnormalities anywhere in one’s anatomy.

The irony is that health-conscious people, who often paid for *whole-body* CT scans out of their own pockets, unwittingly exposed their whole body to **huge** levels of DNA gene-mutating radiation!

#### ABSOLUTELY SHOCKING DATA

The uninformed public is in for a shocker. A study released at the end of last year reveals that CT scans deliver up to **four times more radiation** than what was previously believed, which was already dangerously high.<sup>7</sup>

At the same time, another study led by the **National Cancer Institute** showed that CT scans administered in the year **2007 alone** may contribute to **29,000** new cancer cases and nearly **15,000** cancer deaths.<sup>8</sup>

The problem is that the explosion in unnecessary CT scans has been going on every year. If we carry this back just ten years, this means that **150,000** Americans are facing horrific deaths from



CT scan-induced cancers.

Adding to this impending cancer epidemic are other medical procedures that deliver cancer-causing radiation into the body.

If the *only* benefit you ever obtain from **Life Extension®** membership is the knowledge to avoid unnecessary CT scans and medical X-rays, this alone is well worth the annual membership fee.

### UNSAFE AT ANY DOSE

Doctors argue that the amount of radiation emitted from regular medical X-rays is so low that there is no cancer risk. This flies in the face of data showing that any amount of radiation inflicts free radical damage to DNA that adversely affects our genes.<sup>9,10</sup> We long ago reported statistics indicating that a significant percentage of today's cancers are caused by medical radiation.<sup>8,11-13</sup> Radiation-induced cancers occur in response to mutations in genes that regulate cellular proliferation.

While doctors state that radiation is safe as long as it is kept at a certain level, we argued that even the smallest particle of radiation inflicts DNA damage. For radiation to be safe, all of the DNA damage must be repaired perfectly. Any damage not perfectly repaired creates mutations, any one of which has the potential to lead to further mutations that cause cancer. In fact, we long ago pointed to research showing that the lowest possible dose of radiation is not only unsafe, but also does far more damage than previously thought and is indeed mutagenic.<sup>14</sup>

### NATIONAL ACADEMY OF SCIENCES REPORT

In June 2005, the National Academy of Sciences released a report stating that even very low doses of radiation can cause cancer. In its report, the National Academy defined low dose as being as low as "near zero."<sup>15</sup>

While the researchers indicated that the cancer risk from any given X-ray is very small, their report stated: "**Risk would continue at a linear fashion at lower doses without a threshold and that the smallest dose has the potential to cause a small increase in risk to humans.**"<sup>15</sup>

As you can see by the chart on this page, the amount of radiation emitted from a typical medical X-ray is quite low. Typical X-rays, however, are becoming a relic of the past. CT (computerized tomography) scans provide a much better picture of your insides, but use much more radiation. A CT scan of your abdomen, for example, exposes you to an amount of radiation equivalent to that of **500** or more chest X-rays.<sup>16</sup>

The more worrisome diagnostic procedure is the whole-body scan, which experts have estimated is the equivalent of **900** chest X-rays.<sup>11</sup> According to the *National Academy of Sciences* report, a 45-year-old who planned to undergo 30 annual whole-body scans would potentially increase his or her cancer risk many times.<sup>15</sup>

The National Academy of Sciences stated that there is no radiation threshold below which exposure can be viewed as harmless. This finding means that everyone who has had a medical X-ray is at some increased risk for developing leukemia or a solid cancer. Considering how many X-rays people are exposed to in a lifetime, the risk of developing cancer from the cumulative effects of so many X-rays and CT scans is a serious concern.

### RADIATION OVERDOSES FROM CT SCANS

The amount of radiation a patient is exposed to can be greatly reduced if X-ray technicians took the time to adjust the intensity of the dose depending on individual circumstances. For instance, more radiation is needed for an abdominal CT scan of an obese individual compared to someone lean. A child needs much less radiation than an adult.

You can request “intensity modulated radiation” prior to a CT scan, but whether an apathetic technician pays attention to your request is another matter. They are more likely to state there is no danger to any dose they administer.

As risky as properly done CT scans are, reports published at the end of 2009 exposed instances of major medical centers being so sloppy in adjusting the settings on their CT scanners that patients were exposed to up to **eight times** the normal radiation dose.<sup>17-19</sup>

Children are more vulnerable to the long-term effects of the DNA damage inflicted by X-rays. In one particularly heinous case, a 30-month-old child was exposed to more than **60** minutes of continuous CT scans when the normal time period is only **2-3** minutes. The hospital’s radiology manager called the overdose a “*rogue act of insanity*” while the chief of the state’s regulatory division said it was “*one of the more egregious, extreme cases that I have ever seen.*”<sup>20</sup>



The reality is that for the convenience of the X-ray technicians, CT scanner settings are seldom adjusted to use the least amount of radiation to obtain a clear image.

Diagnostic Procedure	Typical Effective Dose (mSv) <sup>1</sup>	Number of Chest X-rays (PA film) for Equivalent Effective Dose <sup>2</sup>	Time Period for Equivalent Effective Dose from Natural Background Radiation <sup>3</sup>
Chest X-ray (PA film)	0.02	1	2.4 days
Skull X-ray	0.07	4	8.5 days
Lumbar spine 1.3	65	158 days	
IV urogram	2.5	125	304 days
Upper GI exam 3.0	150	1.0 year	
Barium enema 7.0	350	2.3 years	
CT scan (head) 2.0	100	243 days	
CT scan (abdomen)	10.0	500	3.3 years

1. Effective dose in millisieverts (mSv).
2. Assumes an average “effective dose” from chest X-ray (PA film) of 0.02 mSv.
3. Assumes an annual average “effective dose” from natural background radiation of 3 mSv in the US.

Source: European Commission, Radiation Protection Report 118, “Referral guidelines for imaging.” Directorate General for the Environment of the European Commission; 2000.

### TRIBUTE TO THE PIONEER WHO TOOK ON THE ESTABLISHMENT

In 2005, I had the privilege of receiving a telephone call from **John Gofman, MD, PhD**. For those who don’t know, he was one of the great scientific minds of the 20th century. Dr. Gofman praised our work for getting the word out about the lethal dangers of medical X-rays and encouraged us to keep up the fight.

Dr. Gofman was a **physicist** turned **medical doctor** whose early work on radioactive isotopes resulted in his recruitment to work on **The Manhattan Project** at Los Alamos, New Mexico to develop the first atomic bomb.

In **1947**, Dr. Gofman began research that would soon lead him to conclude that **cholesterol** is a cause of **atherosclerosis**.<sup>21,22</sup> Dr. Gofman and his colleagues were the first to show that specific fractions of cholesterol such as **LDL** (low-density lipoprotein) are the most dangerous. Dr. Gofman was involved in the publication of possibly the first book in **1951** about how low-fat and low-cholesterol diets prevent heart disease.<sup>23</sup>



Dr. Gofman’s expertise on the biological effects of radiation caused him to later take a very controversial position. He meticulously documented how diagnostic X-rays were a cause of cancer and vascular disease in the 1960s, long before anyone suspected this link. The Atomic Energy Commission and medical establishment fiercely contested Dr. Gofman’s allegations that medical X-rays caused any harm.

I am always amazed at individuals who are able to contribute so much to our scientific base of knowledge. In Dr. Gofman’s case, he was instrumental in harnessing nuclear energy, warning of the dangers of low-level radiation, and then moved on to a completely different field to discover specific fractions of cholesterol that cause atherosclerosis.

I was saddened to learn that Dr Gofman died of heart failure two years after my conversation with him, possibly caused by the radiation exposure he encountered while working with radioactive isotopes.

## DR. GOFMAN EXPLAINED HOW X-RAYS CAUSE ATHEROSCLEROSIS

John W. Gofman, MD, PhD, was Professor Emeritus of Molecular and Cell Biology at the University of California, Berkeley and one of the world's most distinguished medical and nuclear scientists. His research showed that no amount of radiation—no matter how small—is safe.<sup>24-27</sup>

Dr. Gofman's data analysis conflicts with other reports from the standpoint that he believed far more cancers are caused by medical radiation. Further, he came to the conclusion that exposure to radiation from medical procedures is a "highly important (probably principal) cause" of cancer and ischemic heart disease in America.<sup>13</sup>

How would radiation cause heart disease? According to Dr. Gofman, the same way it causes cancer. Radiation damages DNA—in this case, DNA in the arteries. The radiation-induced changes create a cancer-like phenomenon in the arteries known as atheroma. Dr. Gofman believed that the interaction between atheromas and lipids blocks arteries and causes blood clots.

One of radiation's most striking effects is causing arterial cells to multiply abnormally. The abnormal growth of cells lining the arteries has the effect of narrowing the arteries.

Abnormal growth of smooth muscle tissue inside the artery creates something similar to scar tissue that occludes the arteries and ruins their flexibility. Lipid-laden cells, monocytes, macrophages, cholesterol, fibrin, and calcium are all components of plaques and collect within damaged areas in the inner arterial wall where arteries eventually clog.

As early as **1944**, scientists showed that radiation could produce plaques and foam cells.<sup>28</sup> Since then, additional studies have demonstrated that radiation can produce arterial lesions, sticky platelets, and increased free radicals.<sup>29-34</sup> In fact, radiation can create atherosclerosis in its entirety.<sup>35</sup> Studies show that people who have undergone radiation of areas containing major blood vessels often develop atherosclerosis in those blood vessels.<sup>36,37</sup>



## Lethal Danger of CT Scans

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### MEDICAL RADIATION AND TODAY'S BREAST CANCER EPIDEMIC

Breast cancer incidence has sharply increased since the year 1960. This correlates with an exponential increase in the use of medical X-rays.

The most recently released data indicate that as many as 2,000 excess cases of breast cancer will develop as a result of CT scans performed in the year 2007 alone!<sup>38</sup>

Dr. John Gofman, however, knew this nearly 40 years earlier. In 1970, Gofman and his colleague Arthur Tamplin wrote to *The Lancet*<sup>39</sup> expressing their concern that the amount of radiation needed to double the risk of breast cancer was very low. Young women were especially vulnerable, he said, and the greater the radiation exposure, the greater the risk. The evidence was there that radiation exposure could significantly increase the risk of breast cancer, but few were following up on this critical research.

In a lecture given at a meeting held by the American Association for the Advancement of Science in 1994, Dr. Gofman presented his findings showing that there was increased breast cancer in Japanese women who survived the US atomic bombings of Hiroshima and Nagasaki.<sup>40-42</sup> Studies on mice and guinea pigs showed that cancer-resistant animals developed breast cancer if given repeated doses of radiation.<sup>43</sup> But the most damning research about breast cancer and radiation was preliminary data from young women who had undergone repeated fluoroscopies as part of their tuberculosis treatment from 1930-1950. These women were developing breast cancer at more than double the expected rate.<sup>44-48</sup>

In preparing for the breast cancer talk, Gofman began looking into how many cases of breast cancer in America might be caused by radiation exposure. His first estimate was that 35% of all breast cancer cases wouldn't exist had the women not been exposed to medical radiation. His revised estimate, published a year later, was 75%.<sup>49</sup> Gofman paid particular attention to such exposures during years 1920-1960 because those exposures would contribute to breast cancer rates for at least the next 45 years. Gofman did not believe these exposures were the only cause of the women's cancers, but he believed they played a major role in making them come about.



According to Gofman, the lag time between radiation exposure and cancer is variable. Data shows that the average lag time between radiation exposure from the American raids on Japan and the appearance of breast cancer in Japanese women was about 12 years.<sup>41</sup> However, it can occur sooner or later. Radiation has greater carcinogenic effects on younger people. Data from the Japanese studies show that if a woman was 20 years old or younger when exposed to the radiation, she had a **13-fold** elevated risk of breast cancer occurring by the time she was 35 (assuming 1 Sievert of radiation).<sup>50</sup> Some studies put the risk for older women at double. Regarding children, it has been stated that 10 rads administered to a fetus is enough to produce all forms of childhood cancer, whereas the same amount in an adult would not have that effect.<sup>51-54</sup>

Critics were unable to demonstrate that Gofman's 75% radiation-induced breast cancer figure was wrong. They could challenge it using different assumptions, but as Gofman puts it, "*they were unable to show any basis for thinking that their assumptions were more likely to be right than our assumptions.*" (Editor's note: Human radiation research is based necessarily on assumptions because human experiments cannot be done.)

### THE OTHER SIDE OF THE STORY

While the radiation emitted from CT scans will cause hundreds of thousands of cancer cases and an untold number of heart attacks and strokes, this does not mean that they should be banned.

You may remember the term "*exploratory surgery*" to describe hospital operations that used to be done to diagnose a disease. With the advent of imaging devices like CT scanners, these risky hospital procedures have become a virtual relic of the past.

If a patient suffers an acute stroke, an emergency CT scan can determine whether it is an *ischemic* (blocked artery) stroke or

*hemorrhagic* (blood vessel bleed) stroke. If an ischemic stroke is quickly diagnosed and treated with a clot-busting drug like TPA (tissue plasminogen activator), brain damage can be mitigated or eliminated. A hemorrhagic stroke, on the other hand, might require immediate surgery to repair the broken blood vessel. CT scans can also help doctors ascertain areas of trauma in severe accidents.

Stroke or accident victims might not have time for **magnetic resonance imaging** (MRI) or **magnetic resonance angiography** and therefore require an immediate CT scan.

While **Life Extension** recommends that **magnetic resonance imaging** or **ultrasound** diagnostics be used in place of X-rays whenever possible, the following medical problems may require that a CT scan be performed as opposed to MRI:

- **Patient has a cardiac pacemaker;**
- **Patient has an implantable cardiac defibrillator;**
- **Patient has a metallic foreign body near or in their eye;**
- **Patient has an aneurysm clip on one of the delicate blood vessels in the brain;**
- **Patient has metallic orthopedic hardware such as metal screws or plates to hold bone(s) together.**

In general, MRI offers better contrast resolution and better assessment of soft tissue pathology like tumors, ligaments, and tendons. MRI also offers the ability to change the reference plan for imaging without needing to move the patient. CT scan, in comparison, is better than MRI at evaluation of bony lesions (e.g., bone metastasis) and bone fractures.

If a CT scan is absolutely necessary, ask that the intensity be modulated so the least amount of radiation needed to obtain an image is used.

Cancer patients can often benefit from whole body PET (positron emission tomography) scans whereby metastatic lesions can be detected by virtue of the “hot spots” that their *hypermetabolic* activity generates. The amount of radiation emitted in PET scans (or PET CT scans) is similar to a typical CT scan. While avoiding needless radiation is important for otherwise healthy people, cancer patients can benefit from the data gathered from PET scans by virtue of identifying the existence and location of metastatic disease before symptoms manifest.

## MY PERSONAL EXPERIENCE WITH NEEDLESS RADIATION EXPOSURE

Crooked doctors exposed me to an enormous amount of needless radiation at an early age. Unless the nutrients I take (like high-dose vitamin D) *reverse* the radiation-induced gene mutations, I will be vulnerable to a host of cancers and heart disease for the rest of my life.

As you have read, medical X-rays not only damage genes that regulate cellular proliferation (thereby increasing cancer risk), but they also damage the inner lining of the arteries (the endothelium) thereby increasing cardiovascular risk.

When I was age **27**, I developed some heart palpitations. Had I known a competent cardiologist at the time, my **mitral valve prolapse** would have been diagnosed by a low-cost **ultrasound** test.



Instead, I was ordered to check into the hospital where my health insurance company was financially raped in every way imaginable. The cardiologist insisted that I undergo an **angiogram**, a procedure that involved threading a catheter into my heart to evaluate my arteries and valves. A continuous X-ray is what guided the catheter going into my heart.

The cost in today's dollars for the needless angiogram I endured is over **\$20,000**. Hospital fees add to this outrageous number.

If you become infuriated when your insurance company refuses to pay for a drug or diagnostic procedure your doctor prescribes, remember that for decades, the conventional medical establishment *defrauded* health insurance companies by ordering all kinds of unnecessary, expensive tests. Insurance companies have become so defensive today that they often deny patients necessary diagnostics such as **magnetic resonance imaging** (MRI) that do not emit ionizing radiation.

I hope that anyone reading this article has acquired the information and fortitude to say no the next time their doctor tries to perform an unnecessary X-ray or CT scan.

## THE VALUE OF INFORMATION

When a cardiologist told me that I needed an angiogram, there was no one to turn to for guidance. Conventional medicine ruled in that era, and doctors were seldom challenged. If I could have just called an organization like the **Life Extension Foundation**® back then, I would have been told that the **ultrasound** diagnostic procedure was all I needed.

As a **Life Extension member**, you are armed with cutting-edge information that can enable you to make medical choices based on hard science—not on antiquated dogma or financial bias.

While some medical X-rays are unavoidable, you should inquire as to whether an ultrasound, MRI (magnetic resonance imaging), or MRA (magnetic resonance angiography) might provide alternative imaging. You might also question whether a particular X-ray is necessary, as doctors often prescribe them merely to protect themselves from liability. This may be good for doctors as it confirms their diagnosis, but bad for you as your DNA can sustain irreversible damage.



Heart scans, CT scans, whole-body scans, PET scans, and virtual colonoscopies all emit tremendous amounts of radiation and should not be used for routine screening.

I remain dedicated to educating the public to avoid unnecessary CT scans and medical X-rays. Low-cost ultrasounds can sometimes substitute, whereas higher-cost MRIs can sometimes yield more detailed images. **Blood tests** can provide a better indicator of coronary artery disease risk than heart CT scans, while simultaneously identifying *correctable* risk factors such as elevated LDL, triglycerides, glucose, and C-reactive protein.

In this month's issue, we discuss ways of protecting one's DNA against the carcinogenic and atherogenic effects of ionizing radiation in case a CT scan or medical X-ray is required.

For longer life,

Handwritten signature of William Faloon.

William Faloon

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