

A large, stylized graphic of a nuclear mushroom cloud. The top part is a grey, billowing cloud. Below it is a yellow and orange column representing the fireball and fallout. At the base is a white, billowing cloud. The background is a solid green color.

SURVIVING NUCLEAR FALLOUT

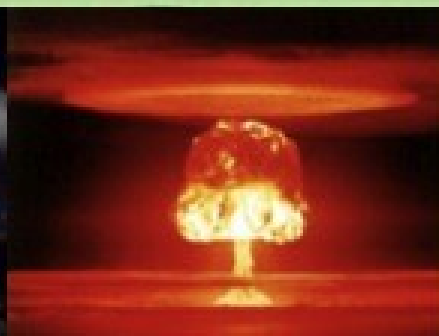


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THE HEALTH EFFECTS OF RADIATION EXPOSURE

The calamity in Japan with possible meltdowns of the nuclear power station in Fukushima is now a reality and a time-bomb waiting to happen. There is also the possibility that radioactive particles can follow the jet streams to the US, Alaska, Hawaii and other countries.

When uranium-235 nuclei are split in a nuclear reactor, various radioactive fission products arise. The most harmful are iodine-131, caesium-137, strontium-90 and plutonium-239. Dust particles in the air with radioactive elements may be inhaled, deposited in the earth by rainfall and water, or enter the food chain via plants.

When the cells of the body are exposed to such radiation, free radicals are produced. These free radicals or ions may impair cellular function and damage may be caused to the DNA in the cell nucleus, which carries the genetic information for cellular replication, structure and function. It is now scientifically recognized that such damage to the DNA can cause cancer and other genetic abnormalities.

As a Holistic health practitioner working in Cyprus, I have recently been bombarded with questions from my own patients and readers of my blog (www.docgeorge.com) as well as my articles (www.naturaltherapycenter.com)

As protecting oneself from radiation exposure is a large and complex topic, I have written this e-Book in an attempt to satisfy the layperson as well as the inquisitive practitioner who is interested in helping their patients. The approach is based on a holistic premise, as I do not believe that there is one healing modality that can help the complex issue of radiation exposure.

Overall Health

Weak organ systems, a poor immune system, high levels of toxicity in the body from other heavy metals and xenobiotics, an imbalanced pH, lots of internal inflammation from eating the wrong diet, smoking, drinking alcohol excessively, lack of exercise and dehydration, is likely to make you more vulnerable to additional stressors. So, if exposed to nuclear fallout, it is highly likely that you will be weakened even further in these vulnerable regions of the body.

It is best to prepare now by cleaning the body on different levels, as well as taking good quality multivitamin supplements to keep your supplies of nutrients to a high level. You can see the outline of what to do in one of my articles entitled: [“Is Your Body in Need of a Good Clean?”](#) This is a very good starting point for improving overall health!

So where do we begin?

I think it would be prudent to begin by trying to understand the various health effects that radiation exposure can have on the body – there are many factors that can affect the way symptoms develop including intensity of radiation, time exposed and the current status of health of the individual.

As radiation can adversely affect the body systemically – basically affecting all organs and tissues – then there is no one substance that can help on all levels of healing. I say this as there has been a lot of emphasis and focus on using potassium iodide as a radioprotective against all kinds of radiation. The truth is that this will protect to a certain degree against radioactive iodine, but not against radioactive cesium, strontium, uranium and others.

Harmful Effects of Radiation Exposure on the Body

Once radiation enters the body it has the potential to damage every tissue and organ in the body. However, the most vulnerable tissues are the fastest growing tissues of the body as radiation can do three times more damage during the growth phase of cells. Bone marrow which makes red blood cells are very fast growing cells, so is the developing fetus in the mother's womb, as are children because their body cells are dividing rapidly due to growth – all these are extra sensitive to radiation exposure.

Other sensitive areas would be the testes and ovaries which can be rendered sterile with very small doses of radiation. The skin and the intestinal lining are much more resilient while the most resistant cells are the brain cells because they grow the slowest.

Death within a few hours can occur when there is sudden exposure to large doses. Exposure to lower doses of radiation may lead to leukemias, cancers of the thyroid, brain, bone, breast, skin, stomach, and lung, cataracts or other adverse health effects much later on in life. It may take a few weeks to a couple of years to recover from lower radiation doses.

Heavy radiation exposure can lead to *acute radiation sickness*. The signs and symptoms or radiation sickness¹ vary according to the dose of radiation and tissues exposed, but the general symptoms include:

- Nausea and vomiting
- Diarrhea
- Weakness

¹ This information was initially compiled mostly from survivors of the atomic bomb blasts over Japan in 1945.

- Lethargy and fatigue
- Loss of appetite (anorexia)
- Fainting
- Inflammation of tissues (swelling, redness or tenderness)
- Skin burns (skin reddening)
- Dehydration
- Hemorrhages under the skin
- Bleeding from your nose, gums or mouth
- Anemia (low red blood cell count)
- Hair loss (usually from just the scalp)
- Decrease in platelets

The initial symptoms reported by the Japanese and American observers in 1945 were the loss of hair from the scalp, bleeding into the skin, inflammation of the mouth and throat, vomiting, diarrhea, and fever.

Nausea and vomiting that appeared within a few hours after the explosion was frequently noted and while it usually subsided by the following morning, occasionally it continued for 2-3 more days. Diarrhea of varying degrees of severity was also observed and in severe cases, it was frequently bloody.

Tissues of the mouth and throat are likely to begin dying as the tissues break down with low white blood cell counts being the norm.

The syndromes of acute radiation illness can be divided into three categories, based on the amount of radiation dosage in total.

The 3 Categories of Acute Radiation Sickness:

1. The ***cerebrovascular (brain) syndrome*** – this is when the total dose of radiation is extremely high, exceeding **20 to 30 Gy²**. A person with cerebrovascular (brain) syndrome rapidly develops confusion, nausea, vomiting, bloody diarrhea, and shock. Within hours their blood pressure falls due to heart and circulatory damage, accompanied by the inability to coordinate gait, seizures and coma. Patients often die within hours (usually within the first two days) after severe radiation exposure.

² The gray (symbol: Gy) is the international system of units (SI) unit of absorbed radiation dose of ionizing radiation and is defined as the absorption of one joule of ionizing radiation by one kilogram of matter (usually human tissue).

In particular, the cerebrovascular syndrome has 3 phases: the first period of nausea and vomiting; then listlessness, drowsiness, apathy and confusion; and finally, tremors, convulsions, seizures, coma, with death usually within a few hours. Since the cerebrovascular syndrome is always fatal, treatment is geared toward providing comfort by relieving pain, anxiety, and breathing difficulties.

2. The ***gastrointestinal syndrome*** occurs when the radiation dose is smaller but still high, and is due to the effects of radiation on the cells lining the digestive tract. Doses in the **10-20 Gy** range affect the intestines, stripping their lining and leading to death within 3 months due to vomiting, diarrhea, starvation, and infection.

Victims receiving 6-10 Gy all at once usually escape an intestinal death, but instead face bone marrow failure and death within 2 months from loss of blood and the protection against infection provided by white blood cells.

The symptoms of people suffering from gastrointestinal syndrome include nausea, vomiting and diarrhea that can lead to severe dehydration, diminished blood plasma volume and vascular collapse that can result in death within 3-10 days. Severe nausea, vomiting, and diarrhea begin 2-12 hours after exposure to **4 Gy** or more of radiation; and the symptoms may lead to severe dehydration, but they usually resolve themselves after 2 days.

There will be a period of feeling well, after which there is often a return of bloody, severe diarrhea which will produce a state of severe dehydration, so plenty of fluids and minerals is important during this time. The intestines contain a variety of good and bad bacteria which will begin invading the rest of the body resulting in severe infections.

It is important that people with the gastrointestinal syndrome take intravenous fluids if available, or regular drinks of pure mineral water – sedatives may also be required to calm the person down. It would also be wise to isolate the person so they are not exposed to more microbes. In severe infections it may be necessary to give medicinal antibiotics, such as neomycin, but probiotics such as lactobacillus and bifidobacteria should also be given.

3. The ***hematopoietic syndrome*** is caused by the effects of radiation on the bone marrow, spleen, and lymph nodes, which are the primary sites of blood cell production (hematopoiesis). The hematopoietic syndrome is characterized by loss of appetite, apathy, lethargy, nausea and vomiting that usually begin 2-12 hours after exposure to **2 Gy³** or more of radiation

³ It is worth noting that there is no safe level of radiation – even small doses are cumulative and can lead to cancers that take many years to develop.

and may be maximal within 6-12 hours from this yet smaller radiation exposure. The symptoms typically subside completely within 24-36 hours after the exposure, and the person typically feels well for a week or more.

However, during this symptom-free period the lymph nodes, spleen and bone marrow begin to waste away leading to a severe shortage of white blood cells, which are the body's main defense against infection, followed by a shortage of platelets and then red blood cells. This is the critical point where the person needs to be supported nutritionally to build blood cells and increase immunity, otherwise many hematopoietic patients die within 30-60 days after exposure.

Once again, the early symptoms of Acute Radiation Sickness (ARS) typically involve nausea, vomiting, headache and diarrhea which will start within minutes to days after the exposure, last for minutes up to several days, and may come and go. The person will usually look and feel healthy for a short time - mistakenly thinking they are all well - after which they will become sick again with loss of appetite, fatigue, fever, nausea, vomiting, diarrhea, and possibly even seizures and coma. This seriously ill stage may last from a few hours up to several months.

The lifetime risk of fatal cancers associated with exposure to low doses of radiation (100 mSv [equivalent to 100 mGy])⁴ at low dose rates is estimated to be a factor of 2 to 4 less than the risk associated with exposure to higher doses and dose rates (NRC, 1990).

Medical Radiation:

The average radiation dose from an abdominal X-ray is 1.4 mGy, that from an abdominal CT scan is 8.0 mGy, that from a pelvic CT scan is 25 mGy, and that from a selective CT scan of the abdomen and the pelvis is 30 mGy.

It is interesting to note that in radiation therapy, the amount of radiation varies depending on the type and stage of cancer being treated. For curative cases, the typical dose for a solid epithelial tumor ranges from 60 to 80 Gy, while lymphomas are treated with 20 to 40 Gy – this dose is normally fractionated or spread out over time, giving about 2 Gy daily for many consecutive days. Preventive (adjuvant) doses are typically around 45–60 Gy in 1.8–2 Gy fractions (for breast, head, and neck cancers).

The whole-body exposure threshold for acute hematopoietic syndrome or "radiation sickness" is 500 mGy. A dose of ~3,000 mGy produces an acute gastrointestinal syndrome that can be fatal without major medical intervention, and a dose of ~ 5,000 mGy is considered the human LD 50 / 30, that is, the lethal dose for 50% of the population in 30 days, even with treatment. These are acute thresholds: the same dose fractionated over a series of exposures or over a

⁴ One Gy is equivalent to 1,000 mGy – 1 mSv is equivalent to about 1 mGy.

longer time may produce less injury, as the body has a chance to repair damage between exposures.

For radiation protection purposes it is assumed that any dose above zero can increase the risk of radiation-induced cancer (i.e., that there is no threshold). Epidemiologic studies have found that the estimated lifetime risk of dying from cancer is greater by about 0.004% per mSv of radiation dose to the whole body (NRC, 1990).

NATURAL REMEDIES TO PROTECT AGAINST RADIOACTIVE EXPOSURE

ANTIOXIDANTS

One of the prime mechanisms that radioactive isotopes work in the body is to create a tremendous amount of free radical damage. Research has shown that taking antioxidants can help combat these harmful free radicals that will attack and damage cell walls and the DNA in the nucleus of the cell.

So which antioxidants have shown to be the most effective in protecting us against radiation exposure?

There are three specific nutrients that scientific studies have shown to protect our organs and cells against radiation damage:

1. [A-Lipoic Acid](#)
2. [Tocotrienols](#)
3. [Antioxidants from berries](#)

Lets look at these in more detail.

A-Lipoic Acid:

[A-Lipoic acid](#) is a powerful fat and water-soluble antioxidant - animal studies have shown that it helps to protect the brain, liver, spleen, kidney, and testes against radiation exposure.

For several decades now, the health status of 6,000 workers from Latvia who went to clean-up the Chernobyl Nuclear Power Plant has been monitored carefully. A study conducted on some of these workers 10 years after the fact showed that 600 mg of A-lipoic acid for two months was able to normalize many of the abnormalities from their laboratory tests. Indeed, pre-treatment with A-lipoic acid has been shown to significantly reduce radiation exposure damage to the brain.

So the antioxidant of choice is [A-Lipoic Acid](#) which is available in 100mg and 500 mg capsules – one can take up to 1,000 mg daily without any adverse side effects and this would be a good starting point when there is an imminent threat of being showered with nuclear radiation or when there is gradual, low radiation exposure.

Vitamin E And Gamma Tocotrienols:

[Tocotrienols](#) are a unique form of vitamin E that offers protection that regular vitamin E does not. In an animal experiment carried out by the U.S. Armed Forces Radiobiology Research Institute it was shown that gamma tocotrienol can protect against whole body radiation exposure.

Excessive radiation exposure damages DNA, especially DNA relating to hematopoietic stem cells (HSCs) that constantly rejuvenate blood and can become any of the white or red blood cells, as well as the hematopoietic progenitor cells (HPCs) that transform into specific blood cells. Both HSCs and HPCs are the life force of blood cell rejuvenation and essential to your good health.

Research has shown that using a form of [vitamin E](#) containing gamma tocotrienol will preserve 80 – 86% of stem cell colonies (HSCs) in gamma tocotrienol-treated mice, while they were 50% reduced in controls. Similarly, progenitor cells (HPCs) have recovered completely within 7 days in gamma tocotrienol treated mice, while they remained at 30% for weeks in the controls.

A detailed analysis of the bone marrow showed that gamma tocotrienol maintained the regenerative integrity of bone marrow cells. Gamma tocotrienol protects hematopoietic tissue by preserving the HSCs and HPCs and by preventing persistent DNA damage.

Another extremely damaging free radical produced during radiation exposure is peroxynitrite – animal studies again have shown that gamma tocotrienol can reduce the levels of peroxynitrite, therefore alleviating DNA damage.

Antioxidants from Berries:

Recent animal research conducted by the United States Department of Agriculture showed that blueberry and strawberry extracts helped prevent brain damage from radiation exposure. Interestingly, the polyphenols of each fruit protected different areas of the brain - supporting a variety of dietary berry intake and/or supplements with multiple berries.

The Defense Research and Development Organisation (DRDO) has been researching a wild berry called Seabuckthorn. The DRDO says the plant, found in the snowy peaks of Ladakh, has shown the potential of protection against the lethal **60 Co (Cobalt) gamma radiation**.

The radioprotection properties have been attributed to the berry's ability to scavenge radiation-induced free radicals. The plant's immuno-stimulatory action is also said to prevent damage to the cells.

The Aroniaberry plant also provides protection against radiation sickness as it contains anthocyanins from aronia.

SPIRULINA AND CHLORELLA

Spirulina:

When disaster struck with the 1986 reactor meltdown at Chernobyl in the Ukraine, approximately 134 plant workers and firefighters battling the fire at the Chernobyl plant were exposed to high radiation doses - 80,000 to 1,600,000 mrem (800 to 16,000 mSv) - and suffered from acute radiation sickness. Not just the Ukraine, but the neighboring state of Belarus was also affected. It received 70% of the radioactive fallout and 23% of its territory became contaminated with radioactivity.

In total, over 160,000 children⁵ and 146,000 cleanup workers became victims of radiation poisoning that produced higher incidents of birth defects, leukemia, anemia, cancers, thyroid disease, degeneration of spinal fluids, liver and bone marrow, and severely compromised immune systems.

After the Chernobyl nuclear plant accident the Russians used both Spirulina and chlorella.

Experimental trials with children showed that by taking 5 grams of spirulina a day for 45 days, the Institute of Radiation Medicine in Minsk⁶ found that the children showed enhanced immune systems and T-cell counts⁷ and *reduced radioactivity*. The Institute also reported regeneration of bone marrow, spinal fluids, blood and the liver. Dangerously low white blood cell counts of about 1000, typical of leukemia, rose to an average of 3000 in 20 days, and the spirulina produced rapid improvements in the health of treated children compared to others who did not receive the algae.

In particular, spirulina reduced urine radioactivity levels by 50% in only 20 days and so the Institute developed a special program to treat 100 children every 20 days with spirulina. Amazingly, health restoration was reported even when radiation sickness was so advanced that the children's eyeballs were bulging out of their sockets. Furthermore, the healing occurred during the continuous

⁵ Belookaya T, Belarussian Comm. "Children of Chernobyl", Corres.5/31/91.

⁶ L.P. Loseva and I.V. Dardynskaya. Spirulina- natural sorbent of radionuclides. Research Institute of Radiation Medicine, Minsk, Belarus. 6th Int'l Congress of Applied Algology, Czech Republic. Belarus, Sep 1993.

⁷ Qishen P, Guo B, Kolman A. Radioprotective effect of extract from Spirulina platensis in mouse bone marrow cells studied by using the micronucleus test. Toxicology Letters. August 1989; 48(2):165-9.

presence of radiation as well as the presence of radiation contaminated food and water sources.

Based on the Institute of Radiation Medicine in Minsk results, the Belarus Ministry of Health concluded that spirulina accelerates the evacuation of radionuclides from the human body.

In particular, spirulina given to children with accumulated high doses of radionuclides reduced radioactive cesium. No side effects were registered. The Ministry of Health considered spirulina advisable for the treatment of people subject to radiation effects and requested more spirulina from overseas.

A 1993 report confirms the 1990-91 research with spirulina on children with radiation sickness and concluded:

“Use of spirulina decreases radioaction dose load received from food contaminated with radionuclides, Cesium-137 and Strontium-90. Spirulina is favorable for normalizing the adaptative potential of children's bodies in conditions of long-lived low dose radiation.”

There is also a report that children, aged 3 to 7 years old in Beryozovka, also suffered from the radioactivity released from the Chernobyl accident. The children were also victims of lead poisoning due to the presence of a strong local leaded glass industry. When spirulina was given to 49 of these children for 45 days, the physicians also found T-cell suppressors and beneficial hormones rose. In 83% of the children, the radioactivity of the urine once again decreased.

Perhaps the radioprotective effects of Spirulina and other algae can be put down to their high levels of metallo-thionine compounds, which scientists think may strip the body of radioactive metals and protect against radiation damage.

Research presented in Japan showed that metallo-thionine combines with the radioactive heavy metals and eliminates them from the body.⁸

Research from China in 1989 also showed that an extract of spirulina had a positive protective effect from gamma radiation.⁹

⁸ Matsubara et al. Radioprotective effect of metallo-thionine, presented at Radial Rays Conference, Tokyo Japan 1985.

⁹ Qishen P, Kolman et al. Radioprotective effect of extract from spirulina in mouse bone marrow cells studied by using the micronucleus test, Toxicology Letters 1989; 48: 165-169.

Chlorella:

Another algae that has been shown in research to have radioprotective functions¹⁰ is [Chlorella](#). The nucleus of Chlorella contains **chlorella growth factor** (CGF) which is very rich in nucleopeptides that have a protective effect on the nucleus and DNA of the cell. Chlorophyllin,¹¹ a compound found in chlorella, has also been shown in research to protect against DNA damage.

Scientific experiments have found that CGF has powerful rejuvenating effects on the DNA¹² of cells due to its nucleic acids, RNA and DNA, and high content of nucleotides.

Several years ago, Japanese doctors also discovered that giving chlorella to cancer patients going through radiation therapy helped **prevent leucopenia**, which is a sudden drop in your white blood cell count and a major problem with radiation illness!

HMD™

While we are on the topic of Chlorella, I would like to introduce another chlorella-based compound that can be used with chlorella and has been found to chelate a number of heavy metals as well as Uranium-238. The compound [HMD™](#) contains a homaccord of chlorella, chlorella growth factor and cilantro. It has been tested in double-blind, placebo controlled trials with 350 people and recently has undergone other trials with 50 people to show that it was actually chelating uranium-238 from the body. The mean percentage increase of uranium eliminated between the pre and post hair samples was 252.42% (p=.001).

To date there is no natural chelating agent known to mobilize and eliminate uranium-238 from body tissues – research has not been done to see whether HMD can also chelate other radioactive substances.

The [Ultimate Detox Pack](#) is a combination of three remedies that would be highly recommended when dealing with radiation exposure – the pack contains chlorella, HMD and a herbal mixture called *Lavage* that will protect the kidneys, liver, lymphatics, and the blood.

¹⁰ Rotkowska D, Vacek A, Bartonickova A. The radioprotective effects of aqueous extract from chlorococcal freshwater algae (*Chlorella kessieri*) in mice and rats.

¹¹ Kumar S et al. Inhibition of radiation-induced DNA damage in plasmid pBR322 by chlorophyllin and possible mechanism(s) of action. *Mutation Research*. March 1999; 425(1):71-9.

¹² Qishen, P. et al. Enhancement of endonuclease activity and repair DNA synthesis by polysaccharide of spirulina. 1988. Pub. in *Chinese Genetics Journal*, 15 (5) 374-381.

POTASSIUM IODIDE

The media and Internet recently are full of reports of the benefits of using potassium iodide (KI) tablets after a radioactive incident.

[Potassium iodide](#) (KI) contains 76.5% iodine and the thyroid gland uses iodine present in the blood to help it produce the hormone thyroxine, whether it is normal or radioactive iodine-131 from nuclear accidents – the uptake of latter will lead to cancer of the thyroid a few years later.

If the thyroid has stored enough normal iodine, then it will not absorb radioactive iodine and this is the logic used for taking KI in a radiation emergency.

Saturating your thyroid with non-radioactive iodine can therefore possibly limit the risk of damage to your thyroid gland because the KI (potassium iodide) supplies enough non-radioactive iodine that your thyroid glands absorbs it and becomes saturated *before* any radioactive iodine (from fallout or other contamination) presents itself.

It is important to begin taking the KI as soon as there is a radiation emergency – once the thyroid is saturated it will can only absorb 1-2% more iodine, therefore decreasing the amount of harmful radioactive iodine absorbed by the thyroid.

If [potassium iodide](#) is not available, then [potassium iodate](#) (KIO₃) will suffice - in 1999 a World Health Organization report showed that KI and KIO₃ are equals in terms of the bioavailability of stored iodine.

Children with fast growing organs¹³ and tissues will tend to absorb more radioactive iodine than adults, so they will have priority for the KI.

During the Chernobyl nuclear accident there was a sharp increase in the incidence of thyroid cancer¹⁴ among children and adolescents in Belarus and Ukraine. In some regions, for the first four years after the accident the observed cases of thyroid cancer among children aged 0-4 years exceeded expected numbers by 30- to 60-fold. This equates to 36.4% of children under the age of 4 developed thyroid cancer.

In Poland, however, which was hit by the radioactive plume from Chernobyl, the government began handing out KI to 97% of the children (18 million doses), and there has been no similar increase in thyroid cancer in the country.

¹³ Jacob P, Goulko G, Heidenreich WF, Likhtarev I, Kairo I, Tronko ND, Bogdanova TI, Kenigsberg J, Buglova E, Drozdovitch V, Goloneva A, Demidchik EP, Balonov M, Zvonova I, Beral V., "Thyroid Cancer Risk to Children Calculated." *Nature* 1998; 392:31-32.

¹⁴ Becker DV, Robbins J, Beebe GW, Bouville AC, Wachholz BW. "Childhood Thyroid Cancer Following the Chernobyl Accident: A Status Report." *Endocrinol Metab Clin North Am* 1996; 25(1): 197-211.

Another part of Poland's¹⁵ *radioiodine protective strategy*, involved an aggressive ban of radioiodine contaminated food stuffs and milk.

It is important to remember though that potassium iodide tablets **only protect the thyroid gland and do not provide protection from any other radiation exposure!** It will not prevent other radioactive heavy metals from getting into other parts of the body and doing damage.

The effectiveness of KI will depend on a variety of factors, including:

1

- The time a person begins to take it, and the length of time it is taken
- The amount of iodine already stored in the person's thyroid
- How fast the body can metabolize the KI
- How much exposure to radioactive iodine-131 the person becomes exposed to.

The WHO¹⁶ emphasizes that the use of KI should be as an adjunct to:

1. evacuating a contaminated area
2. sheltering away from any radioactive clouds – closing windows and doors, as well as sealing them with tape)
3. controlling the foods you eat - eliminating the likelihood of eating products that are contaminated with Iodine-131. This is critical as most foods that are exposed will be contaminated and this is a quick way of getting radioactive heavy metals into your body.

If KI is not available, then it is possible to get a saturated dose of iodine by painting iodine tincture onto your skin.

According to research by Ken Miller,¹⁷ health physicist at the Hershey Medical Center, using 24 healthy adult male test subjects he found that an adult could get a blocking dose of stable iodine by **painting 8 ml of a 2 percent tincture of iodine on the abdomen or forearm approximately 2 hours prior to I-131 contamination.**

¹⁵ Nauman J, Wolff J. " Iodide Prophylaxis in Poland After the Chernobyl Reactor Accident: Benefits and Risks." *Am J Med* 1993; 94: 524-532.

¹⁶ Rubery ED. "Practical Aspects of Prophylactic Stable Iodine Usage." In: Rubery E, Smales E., 416 eds. *Iodine Prophylaxis Following Nuclear Accidents: Proceedings of a Joint WHO/CEC Workshop*. Oxford, Pergamon Press, 1990; 141-150.

¹⁷ Effectiveness of Skin Absorption of Tincture of I in Blocking Radioiodine from the Human Thyroid Gland" from *Health Physics*, June 1989, Vol. 56, No. 6, pages 911-914.

The author wrote:

“Although there were large variations within each subject group in regard to serum-I levels and thyroid uptakes, the increase in serum-I concentration after topical-I application was effective in reducing the thyroid uptake of I-131. The authors conclude that in the absence of KI, most humans would benefit from topical application of tincture of-I, and that in some the effectiveness would equal that of oral KI.”

If public health officials tell you to take KI, then take it as soon as possible after the announcement. You should take **one dose of 130 mg every 24 hours**.¹⁸

It is not necessary or advisable to take larger doses than the 130 mg daily of KI as the thyroid can only store this amount at any one time. Taking larger doses is likely to cause side-effects that will be unpleasant.

General dosage guidelines as stipulated by the FDA and CDC^{19,20} are as follows:

- Adults should take just one 130-mg tablet of KI in a 24-hour period, or two tablets of 50mg [potassium iodate](#) or [Iodoral](#) (KI) morning and evening.
- Children between 3 -18 years of age should take one-half of a 130-mg tablet (65 mg).
- Children between 1 month and 3 years of age should take 1/4 of a 130-mg tablet (32 mg).
- Infants from birth to 1 month of age should be given 1/8 of a 130-mg tablet (16 mg).
- Women who are breastfeeding should take the adult dose, and their infants should receive the recommended infant dose.
- Children who are approaching adult size (greater than or equal to 150 pounds) should take the adult dose regardless of their age.

It is important to remember that taking a higher dose of KI or KIO₃, or taking KI more often than recommended, will not offer more protection and can cause severe illness and death due to allergic reaction.

People who have existing thyroid issues such as goiter, hyperthyroidism and nodules should consult a professional health practitioner before taking any dose of iodine.

¹⁸ <http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/UCM072265>

¹⁹ Harrison JR, Paile W, Baverstock K. Public Health Implications of Iodine Prophylaxis in Radiological Emergencies. In: "Thomas G, Karaoglou A, Williams ED.", eds. *Radiation and Thyroid Cancer*. Singapore: World Scientific, 1999; 455-463.

²⁰ <http://www.bt.cdc.gov/radiation/ki.asp>

Radiation can travel quickly in air currents – students from the Rensselaer Polytechnic Institute, NY measured radiation fallout in New York (2,300 miles away) during atomic bomb testing over the Nevada desert. Just a few hours after the explosion the students reported that the average radiation readings in nearby towns were 20-100 times higher. Radiation fallout travels quickly and is therefore dangerous.

TREATING RADIATION EXPOSURE WITH OTHER NATURAL REMEDIES AND FOODS

It is crucial that the person exposed should begin taking L-glutamine²¹ as a protective barrier to help rebuild the intestinal walls, and preclinical studies by Fasano (2002)²² suggest [L-glutamine](#) might be useful in treatment of radiation injuries to the gastrointestinal tract.²³ Studies have shown that L-glutamine maintains transepithelial resistance and decreases permeability.²⁴

Boosting immunity and blood formation can be done by taking [mushroom supplements](#) - some of the most powerful mushrooms are prized for their immune modulating properties. These include *Agaricus blazei*, *Cordyceps sinensis*, *Grifola frondosa*, *Ganoderma lucidum*, *Coriolus versicolor* and *Lentinula edodes*. These have been studied for their ability to act as immune modulators in hepatitis and cancer in various in vitro, animal and human studies.

Bee pollen - studies show that bee pollen can significantly reduce the usual side effects of both radium and cobalt-60 radiotherapy and also the sickness after massive abdominal x-rays. One study showed that the proliferation of cancer cells stopped in cancerous tumors induced in mice.

The shortage of platelets, which cause blood clotting, may cause uncontrollable bleeding, although a natural remedy for increased platelet production is [squalene](#) containing **alkylglycerols** – this is also available from plant sources as opposed to obtaining it from sharks. The increased platelets will prevent a serious hemorrhage from developing.

[Panax ginseng](#) has also prevented hemorrhaging after radiation exposure, prevents bone marrow death and stimulates blood cell formation, so it's another supplement to add to one's protocol.

Beta-1,3 Glucan: Extracted from the cell walls of baker's yeast it is a potent immune enhancer. It activates important macrophages and is also an anti oxidant. Studies by the Army showed that glucan was a powerful protectant against a lethal dose of radiation.

Naringin: Radiation is a well-known inducer of free radicals and compounds that can scavenge free radicals may reduce radiation-induced DNA damage. Naringin, a bioflavonoid predominant in [grapefruit and other citrus fruits](#), has

²¹ <http://ajpgi.physiology.org/content/287/3/G726.full>

²² <http://www.springerlink.com/content/dkj6e5are83ufuue/>

²³ Medina MA. Glutamine and cancer. *J Nutr.* 2001;131(9 Suppl):2539S-2542S; discussion 2550S-2551S.

²⁴ <http://0-ajpgi.physiology.org.library.pcc.edu/content/287/3/G726.full>

been found to scavenge free radicals, therefore it may also reduce radiation-induced damage (Mutagenesis vol. 18 no. 4 pp. 337-343, July 2003).²⁵

Dimethyl Sulfoxide: Or DMSO, a product similar to MSM, prevents DNA Nicking Mediated by Ionizing Radiation or Iron/Hydrogen Peroxide-Generated Hydroxyl Radical.²⁶

Melatonin: As [melatonin](#) administration reversed oxidative organ injury, as assessed by biochemical and histopathological findings, it is suggested that supplementing melatonin may have some benefit for radioactive exposure. Melatonin protects against ionizing radiation-induced oxidative damage in corpus cavernosum and urinary bladder in rats.²⁷

Melanin: These results allow us to draw the following conclusions: adaptive response (to radiation) can be prevented by a radioprotector such as melanin, and melanin is capable of completely removing low-dose radiation effects.²⁸

Polyethylene glycol (anti-freeze in cars): There is disclosed a patented method of protecting animals including humans against ionizing radiation by injecting the animals with a polymer having the approximate formula $H(OCH_2CH_2)_nOH$, where n varies between 4 and 13. Particularly, it is found that polyethylene glycol (molecular weight between 200 and 600), polyethyleneglycolmonoethylether (molecular weight between 200 and 600), and polyvinylpyrrolidone (molecular weight up to 10,000) when injected into standard experimental animals, such as mice, protects them from the lethal effect of ionizing radiation.²⁹

Vitamin C: This may be the most important thing of all to have on hand for many applications, including radiation protection. Store plenty of [Calcium Ascorbate](#) for all the family – it is best taken as a powder in juice – adults can take 5 – 10 grams per day, spread over 3-4 doses throughout the day, which is the equivalent of 5 – 10,000 mg.

The only problem with high levels of vitamin C is the development of diarrhea as the colon absorbs more water – this is called the “bowel tolerance level.” If this is reached, then it would be good to reduce the level of vitamin C until diarrhea subsides. Vitamin C cannot only protect against radiation but also repair damage from previous exposure. There is abundant scientific proof for this assertion.^{30,31}

²⁵ <http://mutage.oxfordjournals.org/cgi/content/abstract/18/4/337>

²⁶ [Proceedings of the National Academy of Sciences](#)

²⁷ [Journal of Pineal Research](#)

²⁸ [Melanin decreases clastogenic effects of ionizing radiation in human and mouse somatic cells and modifies the radioadaptive response](#)

²⁹ [United States Patent 4676979](#)

³⁰ **Vitamin C and Bioflavonoids:** Not to be redundant; researchers at Harvard Medical School said, “Our experiment showed that vitamin C can prevent damage from radiation....it somehow keeps the radiation from killing the cells.” Their experiment indicates that the dosage for humans exposed to intensive radiation would be approximately 10 grams per day - a mega dose.

³¹ <http://www.jstor.org/pss/3578715>

Rutin and Grapeseed extract: Strengthens the capillary walls and reduces hemorrhaging caused by x-rays. In animal studies it reduced the death rate caused by excessive x-rays by 800 per cent. Dose: 100 to 200 mg a day as protective dose. If exposed, 800 mg. or more a day. It is best taking [Rutin and vitamin C and bioflavenoids](#). [Grapeseed extract](#)³² was also found to have even more radioprotective effects than rutin.

Pantothenic Acid: Prevents radiation injuries. [Pantothenic acid](#) and its derivatives may act by increasing levels of CoA and glutathione, leading to protection from oxygen radical species and ionizing radiation.³³ In animal studies, the survival rate was increased by 200 per cent by giving pantothenic acid prior to exposure. Brewers yeast is by far the best source of this substance. Dose: Preventive - 5 mg. to 15 mg. for children, 25 mg. to 50 mg. for adults. Use a double or triple dose as a therapeutic after exposure.

Inositol: [Inositol](#), also found in lecithin, and available in tablet form, helps with all forms of radiation by protecting the hematopoietic stem cells in the bone marrow.³⁴ One could also take 2-3 tablespoons of lecithin daily.

Calcium and Magnesium: are antagonistic to Strontium 90 and therefore will prevent its absorption if the body is saturated with [calcium and magnesium](#). Domite is best. Dr. Linus Pauling says heavy calcium supplementation will reduce strontium 90 absorption by 50 percent, but be careful not to over indulge unless exposed.

Vitamin A – In 1974, researchers from India found that [vitamin A](#), when taken internally by humans, hastened recovery from radiation. In 1984, Dr. Eli Seifter and a team of researchers from the Albert Einstein College of Medicine....reported vitamin A and beta-carotene counteracted both partial and total body gamma radiation. It also improved the healing of wounds; reduced weight loss, thymic and splenic atrophy, and adrenal enlargement; and prevented gastro-ulceration and an abnormal decrease in red and white blood cell formation.

[Vitamin A](#) in therapeutic doses can be taken as 25,000 IU caps, two to three times per day, for adults. During nuclear emergencies or crisis situations, intensive exposure may warrant up to 100,000 IU, but this level should only be taken for no more than three to four weeks.

Combination Antioxidants - recently there was a very interesting study that has shown the effects of combining a number of antioxidant nutrients such as vitamins A, C and E. Kayan et al³⁵ did a study with X-ray technicians who are exposed to unnaturally high levels of radiation over the course of a lifetime. As a

³² <http://pubs.acs.org/doi/abs/10.1021/jf990665o>

³³ Slyshenkov VS , Omelyanchik SN , Moiseenok AG , Trebukhina RV , Wojtczak L . Pantothenol protects rats against some deleterious effects of gamma radiation . Free Radic Biol Med . 1998;24(6):894-899.

³⁴ [http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=3004&context=etd&sei-redir=1#search="inositol+and+radioprotective"](http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=3004&context=etd&sei-redir=1#search=)

³⁵ Kayan M, Naziroglu M, Celik O, Yalman K, Koylu H. Vitamin C and E combination modulates oxidative stress induced by X-ray in blood of smoker and nonsmoker radiology technicians. Cell Biochem Funct. 2009 Oct;27(7):424-9.

result they tended to have higher levels of tissue oxidation. But when a group of X-ray technicians was supplemented with vitamins C (500 mg) and E (150 mg) daily for 15 weeks, their markers of tissue oxidation plummeted, and their levels of natural antioxidants (such as glutathione in red blood cells) rose significantly. It is possible to obtain formulations such as [Extension Antioxidants](#) that also contains other useful antioxidants that are known to combat radiation exposure.

Bee Propolis - Besides the healing and anti bacterial qualities of this substance, it has been effective in clinical stages of radioepithelitis, i.e. inflammation of epithelial tissue due to radiation.³⁶

Liver Support - a report suggests that [milk thistle](#) containing 80% silymarin may prevent radiation toxicity. It enhances liver regeneration after exposure to heavy metals, radiation, or toxic chemicals. It reduces DNA damage and extends survival in animals exposed to dangerous levels of radiation. [Silymarin's](#) free radical scavenging and direct antioxidant effects are credited with producing these results.

Charcoal – Has the ability to absorb and neutralize radioactive substances and some toxic materials. Researchers report that 10 grams or 1 tablespoon of charcoal can absorb about 3 to 7 grams of materials. A German researcher found that charcoal air filters removed more than 70 percent of radioactive iodine from the air. Taking finely powdered charcoal has been found to be one-and-a-half times as effective as the tablets.

Organic Germanium – Should be used in gram amounts for effectiveness. According to one study, “Radioactive rays release electrons that destroy cells and blood corpuscles....[Germanium](#) floating near the blood corpuscles skillfully catches those released electrons and lets them move around its nucleus.” In other studies mutagenesis of cells exposed to cesium-137 and gamma rays, was “remarkably reduced” without affecting cellular growth or survival. It seemed to improve the fidelity of DNA replication. Germanium protects cysteine, an amino acid with known protective value. Dose: 25 mg. to 100 mg. per day is often used in Japan. It can be derived from onions, pearl barley, and watercress.

Prussian Blue - for Cesium-137 and thallium-201 contamination, the most effective detoxification therapy is oral administration of Prussian Blue (PB), which enhances excretion of radioactive cesium by means of ion exchange and reduces the biological half-life to approximately one-third of its normal value.

Prussian blue was first synthesized in 1704 by a Berlin color maker named Diesbach and was used as an industrial and artists' pigment, which it still is. The chemical name for Prussian blue is ferric hexacyanoferrate (II).³⁷ Since the 1960s, prussian blue has been used experimentally as an orally ingested drug to enhance the excretion of isotopes of cesium and thallium from the body by means of ion exchange.

³⁶ <http://www.ncbi.nlm.nih.gov/pubmed/19165751> and <http://onlinelibrary.wiley.com/doi/10.1002/ptr.2774/abstract>

³⁷ <http://edocket.access.gpo.gov/2003/pdf/03-2597.pdf>

Prussian blue has a very high affinity for cesium and thallium.³⁸ Cesium and thallium ions are ordinarily excreted into the intestine, reabsorbed from there into the bile, and then excreted again into the gastrointestinal tract. Orally administered prussian blue traps thallium or cesium in the intestine, interrupts its reabsorption from the gastrointestinal tract, and thereby increases fecal excretion of thallium and cesium. Prussian blue itself is not absorbed across the intestinal wall in significant amounts.³⁹

Prussian blue, in 500-milligram (mg) capsules, is manufactured by HEYL Chemischpharmazeutische Fabrik GmbH & Co. KG (HEYL). HEYL uses the trade name Radiogardase-Cs for its 500-mg capsules of prussian blue.

The FDA reports:⁴⁰

“In reaching our determination on the effectiveness of Prussian blue, we evaluated published reports of a 1987 incident in Goi[acirc]nia, Brazil, where approximately 250 people were contaminated with cesium-137 that had been abandoned after use in a cancer clinic. Forty-six patients with heavy internal contamination were treated with Prussian blue. Data on the whole-body effective half-life of cesium-137 during treatment and after treatment with Prussian blue was completed on 33 of the 46 patients. The untreated mean whole-body effective half-life of cesium-137 is 80 days in adults, 62 days in adolescents, and 42 days in children.”

Prussian blue reduced the mean whole-body effective half-life of cesium-137 by 69 per cent in adults, by 46 per cent in adolescents, and by 43 per cent in children. Data from additional literature articles, including a study of 7 human volunteers contaminated with trace doses of cesium-137 and reports on 19 patients contaminated with cesium-137 in other incidents, show a similar reduction in whole-body effective half-life after administration of Prussian blue.

³⁸ Dresow, B. et al., “In Vivo Binding of Radiocesium by Two Forms of Prussian Blue and by Ammonium Iron Hexacyanoferrate (II),” *Clinical Toxicology*, 31:563–569, 1993.

³⁹ Kostial, K. et al., “Simultaneous Reduction of Radioactive Strontium, Caesium, and Iodine Retention by Single Treatment in Rats,” *The Science of the Total Environment*, 22:1–10, 1981.

⁴⁰ <http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm130337.htm>

HERBS THAT HAVE A RADIOPROTECTIVE EFFECT

The development of effective radioprotectors and radiorecovery remedies is of great importance in view of their potential application in cases of nuclear radiation exposure as is the case with Japan, Chernobyl and others. Here are a few herbal remedies that have been researched for their radioprotective effects:

Haemopoietic stimulation

Exposure of nuclear radiation can lead to injury to the lymphoid and haemopoietic system of the body, which can result in septicaemia and death.⁴¹ There are a number of herbs that have been researched and shown to accelerate haemopoietic regeneration, therefore preventing microbial infections and enhancing survival. These herbs include:

- *Acanthopanax senticosus*
- *Ginkgo biloba*
- *Hippophae rhamnoides* (Sea Buckthorn)
- *Panax ginseng*
- *Podophyllum hexandrum*
- *Tinospora cordifolia*
- *Boerhaavia diffusa*
- *Spirulina*

These herbs all provide total-body radiation protection by stimulating haemopoiesis.^{42,43,44,45,46,47}

Other herbs can also include:

- ***Centella asiatica* (Gotu Kola)** extract (100 mg/kg body wt.) administered orally has recently been shown to provide total body protection in mice

⁴¹ Prasad KN. 1999. Handbook of Radiobiology. CRC Press: Boca Raton, FL, 344.

⁴² Goel HC, Prasad J, Singh S, Sagar RK, Prem Kumar I, Sinha AK. 2002a. Radioprotection by a herbal preparation of *Hippophae rhamnoides*, RH-3, against whole body lethal irradiation in mice. *Phytomedicine* **9**: 15–25.

⁴³ Kapoor R, Mehta U. 1998. Supplementary effect of spirulina on haematological status of rats during pregnancy and lactation. *Plant Foods Hum Nutr* **52**: 315–324.

⁴⁴ Miyanomae T, Frindel E. 1988. Radioprotection of haemopoiesis conferred by *Acanthopanax senticosus* Harms (Shigoka) administered before or after irradiation. *Exp Hematol* **16**:801–806.

⁴⁵ Song JY, Han SK, Bac KG, et al. 2003. Radioprotective effects of ginsan, an immunomodulator. *Radiat Res* **159**: 768–774.

⁴⁶ Takeda A, Katoh N, Yonezawa M. 1982. Restoration of radiation injury by ginseng III. Radioprotective effect of thermostable fraction of ginseng extract on mice, rats and guinea pigs. *J Radiat Res* **23**: 150–167.

⁴⁷ Thali S, Thatte U, Dahanukar SA. 1998. The potential of *Boerhaavia diffusa* in radiation induced haemopoietic injury. *Amala Res Bull* **18**: 20–22.

- against sublethal (8 Gy) **⁶⁰Co gamma radiation**. There is a herbal formula that contains both Gotu Kola and Gingko Biloba called [Neuron Growth Factor \(NGF\)](#).
- **Ginkgo biloba** - An ethanol (30%) extract of the dried leaf at a concentration of 100 µg/mL was effective when tested on a culture exposed to clastogenic factors from plasma of human subjects exposed to irradiation. Treatment of recovery workers from the Chernobyl accident site was found to be effective when an oral dose of 40 mg/day was given 3 times daily for 2 months. [Ginkgo Biloba](#) capsules standardized to 24% ginkgo flavone glycosides and 6% terpene lactones (120mg) would also work well at one capsule daily.
 - **Hippophae rhamnoides (Sea Buckthorn; Family: Elaeagnaceae)** juice extract inhibits radiation-induced DNA strand breaks in mouse thymocytes in a dose-dependent manner. Hippophae extract under ex vivo conditions induced a strong compaction of chromatin making the nuclei resistant to a radiation dose as high as 1000 Gy.
 - **Peppermint**. Oral administration of *Mentha piperita* (1 g/kg body wt/day) prior to sublethal radiation exposure (8 Gy) was found to be effective against the chromosomal damage in bone marrow of Swiss albino mice.⁴⁸ Irradiated animals exhibited chromosomal aberrations in the form of chromatid and chromosome breaks, centric rings, dicentric exchanges and acentric fragments, while animals pre-treated with *M. piperita* extract showed a significantly lesser number of aberrant cells. It also significantly increased GSH levels and decreased the lipid peroxidation level in irradiated mice. Peppermint tea is available in healthfood stores as well as supermarkets and would be an easy herb to grow.
 - **Ocimum sanctum (Holy Basil)** - Aqueous extract was more effective in increasing survival, compared with the ethanol extract. The optimal dose for protection was reported to be 50 mg/kg b.w (intraperitoneal administration). This extract has also protected mouse liver against radiation-induced lipid peroxidation.
 - **Panax ginseng** has been reported by several workers to show that recovery of thrombocyte and erythrocyte counts in blood after irradiation was the major factor responsible for radiation protection. The whole extract of ginseng and the relative protective effects of various fractions (carbohydrate, protein and saponins) have been evaluated. The results showed that the water-soluble whole extract of [ginseng](#) provided the best protection.
 - **Podophyllum hexandrum** (Himalayan Mayapple; Berberidaceae) Pre-irradiation administration of *P. hexandrum* rhizome extract protected mice in a dose-dependent manner (optimal dose being 200 mg/kg body weight rendering 80% survival for 30 days) against whole-body lethal irradiation (10 Gy). The extract was also found to provide cytogenetic protection, as observed by a decrease in radiation (2 Gy)induced micronuclei frequency

⁴⁸ Ashok Kumar, R.M. Samarth, S. Yasmeen, A. Sharma, T. Sugahara, T. Terado, H. Kimura. Anticancer and radioprotective potentials of *Mentha piperita*. *Biofactors*, Volume 22 Numbers 1-4/2004.

upon pre-irradiation treatment. Radioprotective properties of *P. hexandrum* were found to be comparable and in some cases even better than synthetic radioprotectors such as diltiazem and WR-2721. *P. hexandrum* has also been demonstrated to provide protection to the male reproductive system. *P. hexandrum* has been shown to act in a multifaceted manner and provide protection to the haematopoietic, gastrointestinal, reproductive and central nervous system. It is apparent that *P. hexandrum* is a promising radioprotector and may be useful in providing protection during both planned and unplanned radiation exposures.

- Oral admin. of an aqueous extract of **Tinospora cordifolia** (5 mg/kg body weight per day) to Swiss albino mice 1 h prior to sublethal whole-body radiation exposure (8 Gy) provided 33% survival (at 30 days). The same dose, when given for 15 consecutive days, produced 100% survival until day 9 and 50% of the animals survived until day 24. All the animals died within 30 days suggesting that *Tinospora cordifolia* is partially effective against sub-lethal radiation doses.
- **Cat's Claw**, the Amazonian wonder herb, also known as *Uncaria tomentosa* or *Uña de Gato*, has been available for years, but there are various qualities of extracts. [Samento](#), a water-alcohol extract has properties of DNA repair and anti-inflammation, and immune stimulation. Cat's claw protects cells against oxidative stress and inhibits lipopolysaccharide-induced iNOS gene expression, nitrite formation, cell death and inhibit the activation of NF-kappa.
- **Black & Green Tea** – The polyphenol epigallocatechin gallate (EGCG) derived from [green tea](#) protects animals from whole-body radiation, blocking lipid oxidation and prolonging life span. Several sources indicate that there were hundreds who survived Hiroshima at ground zero and the one thing they all had in common was drinking 20 cups of green tea per day.
- **Astragalus** – An article published in *Cancer*, a publication of the American Cancer Society, reported that the aqueous extract of *Astragalus membranaceus* restored the immune functions in 90 percent of cancer patients studied. An excellent immune booster that contains astragalus and other products mentioned in this article in a tasty formulation is called [Super Immune Quick Start](#).
- **Rosemary** - in two separate studies, scientists in Spain found that nothing fights radiation damage to micronuclei like a simple garden herb known as rosemary. They noted that ionizing radiation causes the massive generation of free radicals that induce cellular DNA damage. They studied the protective effects of several compounds against gamma ray induced chromosomal damage in micronuclei testing by adding various compounds to human blood before and after irradiation. When the compounds were added after gamma-irradiation treatment, the protective effects relied not on scavenging ability, but on activity against free radicals already present in the cells, such as lipoperoxy radicals which are mainly

responsible for continuous chromosomal oxidative damage.

The fact that carnosic acid and carnosol found in rosemary are fat soluble allows them to provide highly significant protective anti-mutagenic activity. Even the most powerful water-soluble antioxidants lack the capacity to protect against gamma ray induced damage.

In their second study, the generation of radiation induced cellular DNA damage to skin from free radicals was the focus. The researchers sought to demonstrate that rosmarinic acid from rosemary would act as a photo-protector both by acting as a scavenger of free radicals and as an inducer of the body's own endogenous defense mechanisms by regulating tyrosinase activity and stimulating melanin production. They found that formulation of toxic malonyldialdehyde was delayed by the use of rosmarinic acid, and the protection factor was 3.34 times greater than for other compounds studied, as measured in micronucleus testing. In vivo testing showed the capacity of orally administered rosmarinic acid to inhibit skin alterations as a result of UV radiation exposure.

In a study from India, scientists investigated the radio-protective potential of caffeic acid⁴⁹ against gamma radiation-induced cellular changes. A dose of 66 microM of caffeic acid showed the optimum protection of micronuclei and was used to investigate the radio-protective effects of the compound. Lymphocytes were pre-incubated with caffeic acid and controls were not. All the lymphocytes were exposed to different doses of radiation. Genetic damage and biochemical changes were measured. Gamma irradiated control lymphocytes showed a radiation dose-dependent increase in genetic damage and a significant decrease in antioxidant status. Caffeic acid pretreated lymphocytes positively modulated all radiation induced changes.

Food sources offering significant amounts of caffeic acid are apples, citrus fruits, and cruciferous vegetables.

⁴⁹ <http://www.ncbi.nlm.nih.gov/pubmed/18561333>

FIGHTING RADIATION WITH FOOD

One of the radioactive elements that we will need to contend with coming out of nuclear power stations is Cesium-137. Cesium is next to potassium on the periodic table, so if your body is deficient in potassium, then there is a higher probability that it will absorb radioactive cesium into the cells. So taking potassium-rich foods would be one way to combat this, here is a list:

- Rice and wheat bran
- Rye and buckwheat flour
- Parsley, celery, radishes, tomatoes, peppers, carrots
- Apricots, bananas, peaches, prunes, raisins
- Pistachio nuts, chestnuts, sunflower, pumpkin and flax seeds
- Bean family
- Fish and crustaceans
- Cheese and eggs
- Tea, coffee and cocoa
- Spices: chervil, coriander, parsley, basil, dill, tarragon, turmeric, paprika

Sea Vegetables – According to a 1964 McGill University study published in the *“Canadian Medical Association Journal,”*⁵⁰ sodium alginate from kelp reduced radioactive strontium absorption in the intestines by 50 to 80 percent. The sodium alginate allowed calcium to be absorbed through the intestinal wall while binding most of the radioactive strontium, which was excreted out of the body.

Some of the more popular sea vegetables to consume are kelp, arame, wakame and kombu. Canadian researchers reported that sea vegetables contained a polysaccharide substance that selectively bound radioactive strontium and helped eliminate it from the body. In laboratory experiments, sodium alginate prepared from kelp, kombu, and other brown seaweeds off the Atlantic and Pacific coasts was introduced along with strontium and calcium into rats. The reduction of radioactive particles in bone uptake, measured in the femur, reached as high as 80 percent, with little interference with calcium absorption.

“The evaluation of biological activity of different marine algae is important because of their practical significance in preventing absorption of radioactive products of atomic fission as well as in their use as possible natural decontaminators.”⁵¹

The Atomic Energy Commission recommends for maximum protection against radioactive poisoning for humans, taking a minimum of 2 to 3 ounces of sea vegetables a week or 10 grams (two tablespoons) a day of sodium alginate supplements.

⁵⁰ Skoryna S.C. et al, "Intestinal Absorption of Radioactive Strontium," *Canadian Medical Association Journal* 191: 285-88, 1964.

⁵¹ Y. Tanaka et al., “Studies on Inhibition of Intestinal Absorption of Radio-Active Strontium,” *Canadian Medical Association Journal* 99:169-75, 1968.

During or after exposure to radiation, the dosage should be increased to two full tablespoons of alginate four times daily to insure that there is a continual supply in the GI or gastrointestinal tract. There may be a rare problem of constipation but this can be avoided if the sodium alginate is made into a fruit gelatin. Agar, derived from sodium alginate in kelp, is a safe, nontoxic substance that can be used as a thickening agent or gelatin.

At the time of the atomic bombing of Japan, Tatsuichiro Akizuki, M.D. was Director of the Department of Internal Medicine at St. Francis's Hospital in Nagasaki and fed his staff and patients a strict diet of **brown rice, miso and tamari soy soup, wakame, kombu and other seaweed, Hokkaido pumpkin, and sea salt and prohibited the consumption of sugar and sweets.**

Anti-Radiation Soup

- 4 ounces tofu, cut in small squares
- 1 ounce kombu or nori, cut in strips
- 3 cups purified water
- 1 Tablespoon miso paste (or to taste)
- 1 lemon
- 1 ½ cups cooked brown rice
- 1 Tablespoon toasted sesame oil (optional)
- Green onions, chopped (optional)
- Cilantro, chopped – this is coriander (optional)

For "Anti-Radiation Soup," add the tofu and seaweed (nori or kombu) to boiling water and simmer for a few minutes. Stir in some miso paste for flavor (do not boil the miso), add juice of lemon and the optional ingredients if desired, cover, and let sit for 15–20 minutes. Serve with brown rice—eaten separately or stirred into the soup. This macrobiotic dish was shown to reduce radiation sickness after the Hiroshima bombing and will probably protect us from some of the hazardous effects of x-rays and metal exposures.

Sugars and sweets were forbidden because they suppress the immune system! Because of this diet - which was rich in sea vegetables – Dr Akizuki saved everyone in his hospital while many other survivors perished from the radiation sickness.⁵²

In his book "Fighting Radiation with Foods, Herbs and Vitamins," (East-West Health Books, 1988) Steven Schecter, N.D. further elaborates on the Canadian studies. He asserts:

"There is no family of foods more protective against radiation and environmental pollutants than sea vegetables ... sea vegetables can prevent assimilation of different radionucleotides, heavy metals such as cadmium, and other

⁵² Tatsuichiro Akuziki, M.D. Nagasaki 1945, London Quarter books, 1981

environmental toxins."

J.F. Stara also showed that sodium alginate significantly reduced the amount of radioactive strontium in the bones of cats. Stara reported that radioactive strontium from the bones was re-secreted into the intestines, bound by the alginates, neutralized and then excreted in the feces:

"The chemical pollution in air, soil and water is particularly serious, since the pollutants find their way into the food chain and their absorption into the body can be hazardous ... Our investigation has shown that alginate can bind radioactive strontium .. binds with other metal pollutants such as excess barium, cadmium and zinc."

A combination of sodium alginate and egg-shell powder was also used in Russia to prevent radiation damage in children who had been exposed to cesium-137⁵³ once again proving the effectiveness of the ingredient.

Additionally, Yukio Tanaka et. al. reported the following:⁵⁴

"The evaluation of biological activity of different marine algae is important because of their practical significance in preventing absorption of radioactive products of atomic fission as well as in their use as possible decontaminators."

In 1974 a report was published by I. Yamamoto et. al. in the *Japanese Journal of Experimental Medicine*, (44: 543-46) wherein the scientists reported that several varieties of **Kombu Mojaban** (common sea vegetables eaten in Asia and traditionally used as a decoction for cancer in Chinese herbal medicine) were effective in the treatment of tumors in laboratory experiments:

In three of four samples tested, inhibition rates in mice with implanted sarcomas ranged from 89-95%.

In fact, the researchers reported that, "The tumor underwent complete regression in half of the mice in each treated group." Similar experiments on mice with leukemia have also shown promising results.

It appears that all sorts of seaweeds can help after radiation poisoning – there are other researcher such as Skoryna⁵⁵ who has shown similar effects.

Most seaweeds are a very good nutritional source of Iodine-127, which is the form of iodine our thyroid gland needs for its proper functioning. Ryan Drum, Ph.D., points out that **bladderwrack** (*Fucus* species) provides di-iodotyrosine (DIT), which is a precursor to forming the essential thyroid hormones thyroxine (T-4) and tri-iodothyronine (T-3). By providing the immediate precursors for T-4 and T-3, *Fucus* seems particularly effective in treating both hypothyroidism and

⁵³ Sukhanov, B.P., et al. "Medical and biological evaluation of new food products for children exposed to excessive radiation." *Gig Sanit*, 1994 Sept-Oct; (8):24-26

⁵⁴ Y. Tanaka, D. Waldron-Edward, and S. C. Skoryna. Studies on inhibition of intestinal absorption of radioactive strontium. VII. Relationship of biological activity to chemical composition of alginates obtained from North American seaweeds. *Can Med Assoc J*. 1968 July 27; 99(4): 169–175.

⁵⁵ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1928749/pdf/canmedaj01115-0027.pdf>

Graves hyperthyroidism.

Other foods that can also help after radiation exposure include:

Beets – Beets have been shown to rebuild hemoglobin of the blood after exposure to radiation. Rats fed a diet of 20 percent beet pulp were able to prevent cesium-137 absorption and 97 to 100 percent more effectively than rats given no beets.

Dried, Primary-Grown Nutritional Yeast – Besides having Vitamin E, it also contains the nucleic acids RNA and DNA, both of which have been shown to have radio protective qualities. It has been shown to help rebuild and regenerate cells damaged by radiation, and also to produce relief from radiation poisoning and its many adverse symptoms.

Garlic - Garlic's high sulfur content supports natural antioxidant systems like glutathione. [Garlic extracts](#) protect red blood cells from radiation damage by a glutathione-related mechanism. In mice, garlic extracts prevented radiation damage to chromosomes in vulnerable bone marrow cells.

Onions – Cysteine, present in onions, binds with and deactivates both the radioactive isotopes and toxic metals such as cadmium, lead and mercury. The sulfur in cysteine helps the kidneys and liver detoxify the body.

HOMEOPATHIC REMEDIES

There has been a considerable body of evidence to suggest that homeopathics can play a role in protecting against radiation.⁵⁶ For instance, in one famous study albino mice were exposed to 100 to 200 rad of X-rays (sublethal doses) and then evaluated later after a period of 24, 48, and 72 hours.

Two homeopathic homaccord medicines - in particular Ginseng 6x, 30x, 200x and Ruta graveolens 30x and 200x - were administered to the mice both before and after the radiation exposure. When those radiation exposed mice were compared with mice simply given a placebo as treatment, it was found that the homeopathic treated mice had *significantly less chromosomal or cellular damage*.

Another study involved homeopathics and albino guinea pigs.

The guinea pigs were exposed to small doses of X-rays, which caused reddening of the skin as radiation exposure normally does. The studies showed that Apis mellifica 7c or 9c had a radio-protective effect and a roughly 50% curative effect on X-ray-induced skin redness skin.

Below will follow some homeopathics that can be used in emergency situations – even though generally homeopathics are safe to use, it is always best to get the advice of a qualified homeopath who is aware of the pitfalls and can guide appropriately.

For general emergency situations where there is nuclear radiation exposure, potencies of 30c and 200c are appropriate, even though an experienced homeopath or naturopath may suggest lower or higher potencies. In general, 30c or 200c homeopathic potencies can usually be taken about 3 times – as the symptoms improve then the dosages per day can be reduced gradually. If there is no improvement in symptoms within 2-3 days, then it probably means that the chosen remedy is not very effective.

Now with uranium exposure, the kidney is usually the first organ to show signs of chemical damage. In hospitals for emergency radiation treatment, oral doses or infusions of sodium bicarbonate help alkalinize the urine, thereby promoting the excretion of the nontoxic uranium carbonate complex, and are therefore used.

There are a number of homeopathic remedies that have been used to treat radiation sickness:

⁵⁶ Khuda-Bukhsh AR, Banik S, "Assessment of Cytogenetic Damage in X-irradiated Mice and its Alteration by Oral Administration of Potentized Homeopathic Drug, Ginseng D200," *Berlin Journal of Research in Homeopathy*, 1991, 1, 4/5:254. Also Khuda-Bukhsh AR, Maity S, "Alteration of Cytogenetic Effects by Oral Administration of Potentized Homeopathic Drug, Ruta graveolens in Mice Exposed to Sublethal X-radiation," *Berlin Journal of Research in Homeopathy*, 1991, 1, 4/5:264.

RADIUM BROMATUM (radium bromide) can be used for illness resulting from radium, radiation burns and X-ray exposure. It can be used in the event of a radioactive release in your area because it can be helpful in counteracting the effects of exposure as well as in treatment of any radiation injuries you may sustain.

In the event of radioactive release, homeopaths recommend taking one daily dose of a 30c or 12c potency as long as the threat of radiation exposure exists, although naturally the best option is to evacuate the area immediately. Some homeopaths recommend up to 10 drops or 5 pellets taken three times a day with severe radiation exposure.

This remedy may be useful for all sorts of skin affections including x-ray caused radiation burns, dermatitis, radium burns, eczema, psoriasis, scleroderma, ulcers, and cancers. Radiation exposure will often cause skin burns, so this remedy may be of assistance in those cases. It is often prescribed for the depletion of energy and burning sensations of the skin after X-rays or radiation therapy to help counteract any side-effects of the treatment.

In general, symptoms calling for this homeopathic remedy involve cases of skin itching all over the body with burning skin, swelling and redness, necrosis and ulceration - an itchy burning of skin, as if on fire (burning heat), often with swelling, small pimples and ulceration that takes a long to heal.

When homeopathic radium bromatum is used because of an atomic or nuclear blast, the dosing schedule depends on how close you were to a source of radiation, such as an explosion. If you feel your skin burning, have a fever, nausea, vomiting or diarrhea then your condition is probably severe and you can put 5-8 pellets in a bottle of water and take a tiny sip every 10 minutes for the next 4 hours.

Thereafter, take a sip every half hour for the next 4 hours, then every hour for the next 4 hours. You should try to do this even if you are being taken to a hospital for treatment and continue daily doses of the homeopathic remedy for two weeks.

If you have no radiation related symptoms but winds are blowing radiation into your neighborhood, then take one dose daily until the radiation drops to a safe level and continue taking the remedy on a daily basis for 2 weeks even after the radiation levels have dropped to acceptable.

Remember to take potassium iodide and the detox baths and algae diets as well. Basically, stay out of the way, take preventative measures and stay in tip-top shape.

URANIUM NITRICUM (nitrate of uranium) can be used in cases of uranium exposure, exposure to depleted uranium or uranium poisoning.

Usually people given this remedy experience symptoms of great emaciation with ravenous appetite, debility, weakness and general edema (swelling with fluid retention), excessive thirst and appetite.

Other keynote symptoms this remedy treats include burning gastric pain, flatulence and vomiting. There can be a feeling of general burning internally and a tearing away or ulcerations in the mouth; stomach and duodenal ulcers with indigestion.

If you remember, these were all the symptoms seen at Nagasaki. Cases of copious burning urination with incontinence, gland swelling, liver degeneration, heat flushes, dry mucous membranes and dry skin, nausea and vomiting are also indications for usage.

As to the use of **PLUTONIUM NITRICUM**, there is not much information available on this remedy but some of the preliminary findings are that individuals experiencing a polarity between feeling very light and elated and feeling heavy, desperate and isolated might benefit from the remedy. Naturally, exposure to plutonium is the number one reason for its usage.

ANACARDIUM is a remedy that can be used to help alleviate the effects of radiation exposure, and is especially appropriate when there are skin ulcerations, general weakness and debility, and when other symptoms match.

The homeopathic remedy **X-RAY** can also be used in the event of radiation exposure when the other symptoms correlate. Like radium bromatum, this is a very good homeopathic remedy to keep in stock as well, and is recommended after X-ray exposure.

Low vitality is a major symptom calling for the usage of X-ray along with slow wound healing, decreased white blood or platelet count, anorexia with nausea, dry, itchy or scaly skin and redness around nail roots, aching pains, chills with night sweats, and sudden neck 'cricks' on alternating sides.

Patients who can benefit from the remedy usually feel better with hot applications and worse in bed, in the open air, in the cold, or when moving. The remedy tends to arouse the reactive vitality both mentally and physically.

PHOSPHORUS may be used for symptoms produced after radiation exposure that includes degeneration of tissue and bleeding. You use it when it matches other symptoms such as there being sudden great weakness, oversensitivity to external impressions, ready bleeding from the skin and any orifice, tissue decay, exhausting diarrhea or vomiting, burning pains, the feeling of a tightened chest,

palpitations and trembling, an empty feeling. The individual may crave cold drinks and feel worse lying down on their left side.

CAUSTICUM can be used after acute radiation exposure when the radiation burns are slow to heal and other symptoms for the remedy's usage match. The keynote symptoms for using the remedy include burning, rawness or recurring soreness of burns, loss of muscular strength or paralysis of single parts, emaciation and weakness, unsteady walking where it's easy to fall down, incontinence.

The individual feels better with cold drinks, bed warmth and gentle motion but feels worse during clear weather, dry cold air, and in the evening.

CADMIUM SULPH 30C or **POTASSIUM IODIDE 30C** taken once before and once after an atomic explosion. These are generally used before symptoms appear, but can be used after as well.

COBALTUM 30C has been known to remove side effects of radiation by taking it four times in one day for 2-3 days. Then an assessment is taken to determine if more is needed and how often. If needed from that point, it is generally used four times in one day every two weeks for 2-3 months. In the hands of a skilled homeopath, this remedy may be used in a 200C potency.

CALC FLUOR 12C and **NATRUM MURIATICUM 6C** thrice daily for several months after exposure and more frequently, if necessary, regardless of which other remedies are chosen from above, these two remedies have a way of helping the body eliminate toxins in tandem with the other remedies.

It's also been suggested that remedies like Plumbum (lead) can be taken after radiation exposure to help those who feel overwhelmed and in need of protection. Belladonna might also prevent and relieve radiation burns and pains - even long after the immediate exposure, and Granite might prove to be a tonic.

There are many homeopathic remedies that can be taken for different circumstances, but the remedy chosen must fit the symptoms and mental state of the individual taking them - this requires the skill of a qualified homeopath who will make the correct homeopathic diagnosis and treatment.

The Homeopathic Schuessler Cell Salts

In the early nineteenth Century, Doctor W.H. Schuessler, a noted German physiological chemist and physicist, identified 12 "tissue salts" located in every human cell. These Tissue Salts or "Cell Salts" are vital mineral constituents of the body and Dr. Schuessler found in his research that if they body was lacking in any of these salts, an imbalance occurs at the cell level which can lead to poor health or disease.

Schuessler cell salts (also called "biochemic cell salts") are a non-prescription item and are available directly from any homeopathic pharmacy.

Dr. Schuessler found that when cells were deficient in these minerals, then an abnormal (diseased) condition was produced and so he developed these homeopathic substances to help a body heal itself.

More information on the salts and their specific health applications will be found in Dr. Schuessler's Biochemistry by J.B. Chapman, M.D. (London: New Era Labs, 1973). Dr. Chapman's excellent book indicates some keynote symptoms for the cell salts, of which the following is a summary:

The Twelve Salts and Some of Their Keynote Symptoms

- 1) KALI PHOS (Kali Phosphoricum; Potassium Phosphate)
 - a. mental/emotional symptoms predominate
 - b. Feel as if "I'm too tired to rest."
 - c. Anxiety, brain fatigue, irritability, temper-tantrums, sleeplessness, dizziness, nervous asthma
 - d. easily bleeding gums
- 2) KALI MUR (Kali Muriaticum; Potassium Chloride)
 - a. white mucus, swollen glands
 - b. white or gray coated tongue, glandular swellings, discharge of white, thick mucus from nose or eyes
 - c. indigestion from rich food
- 3) KALI SULPH (Kali Sulphuricum; Potassium Sulphate)
 - a. yellow mucus, later stages of illness, congestion and cough worse in evening
 - b. dandruff, yellow coated tongue, yellow crusts on eyelids
 - c. gas, poor digestion
- 4) CALC PHOS (Calcarea Phosphorica; Calcium Phosphate)
 - a. teething remedy
 - b. upset stomach, post-nasal drip, chronic cold feet, poor dentition
- 5) CALC SULPH (Calcarea Sulphurica; Calcium Sulphate)

- a. sores that heal poorly, herpes blisters
 - b. pain in forehead, vertigo, pimples on the face
- 6) CALC FLUOR (Calcarea Fluorica; Calcium Fluoride)
- a. poor tooth enamel, cracks in palms of hands, lips
 - b. hemorrhoids
- 7) NAT MUR (Natrium Muriaticum; Sodium Chloride)
- a. dryness of body openings, clear thin mucus
 - b. effects of excess overheating; itching of hair at nape of neck
 - c. early stage of common colds with clear, running discharge
 - d. insect bites (applied locally)
- 8) NAT SULPH (Natrium Sulphuricum; Sodium Sulphate)
- a. rarely needed
 - b. green stools and other excess bile symptoms
 - c. Sensitive scalp, greenish-gray or greenish-brown coating on tongue, influenza
- 9) NAT PHOS (Natrium Phosphoricum; Sodium Phosphate)
- a. simple morning sickness; acid rising in throat
 - b. Headache on crown of head, eyelids glued together in morning,
 - c. grinding of teeth in sleep; pain and sour risings from stomach after eating
- 10) MAG PHOS (Magnesia Phosphorica; Magnesium Phosphate)
- a. Muscle spasms, cramps and menstrual cramps, if always better with heat
 - b. hiccups; trembling of hands
 - c. teeth sensitive to cold
- 11) FERRUM PHOS (Ferrum Phosphate; Ferrum Phosphate)
- a. first stages of inflammation, redness, swelling, early fever
 - b. congestive headache, earache, sore throat
 - c. loss of voice from overuse
- 12) SILICEA (Silica)
- a. white pus forming conditions, boils ("homeopathic lancet"), stony-hard glands
 - b. Sty in eye area, tonsillitis, brittle nails

In particular, it is said that Kali. Phos., Nat. Sulph., Mag. Phos., Calc. Fluor., Silicea, Calc. Phos., Kali. Sulph. and Ferrum Phos. are deficient in the blood of those who suffer from radiation sickness.

The cell salts are not drugs, but usually take months to show results that can be quite subtle in nature. The tablets should not to be washed down with water but dissolved dry on your tongue.

BATHS FOR REMOVING RADIATION

The Epsom Salt Bath

Here's the typical Epsom salt bath formula for detoxifying the body from general radiation exposure, such as from Cobalt-60 irradiated food, X-rays, or air flights where you are subject to high levels of ionizing radiation.

Dissolve 1 pound of sea salt or rock salt and 1 pound of baking soda in a hot bath - as hot as can be tolerated - and soak in the water until the bath becomes cool. This usually takes about 20-25 minutes. Afterwards, do not shower or rinse the salt off your body for 4-8 hours.

If you've been exposed to low-grade radioactive materials from the atmosphere, you can dissolve 2 pounds of baking soda in a tub of hot water, and follow the previous instructions by staying in the water until it cools.

When taking this type of bath, you should also be sipping certain teas or alkalizing your body by mixing ½ teaspoon of baking soda in a glass of warm water and sip it during the bath. It would also be a good idea to take at least 50 drops of [HMD \(Heavy Metal Detox\)](#), three times daily to help mobilize heavy metals, including uranium.

It would also be a good idea to off-load heavy metals BEFORE being exposed to nuclear radiation to help boost the immune system and strengthen other physiological systems in the body.

With radioactive fallout, Dr. Parcells recommended drinking an **8-ounce glass of water** containing ¼ **teaspoon natural sea salt** and ½ **teaspoon baking soda**. According to the severity, this was to be drunk every 2-3 hours and each glass was to be taken with 3 tablets of **calcium lactate** or [calcium hydroxyapatite](#) which is exactly the same calcium that we have stored in our bones; both are very easy forms of calcium for the body to absorb and use.

Sea Salt & Baking Soda & Clay – this is a mixture of the sea salt and baking soda mentioned above, but with the addition of one pound of bentonite, or other safe clay – the radioactive heavy metals will bind to the bentonite⁵⁷ clay and removed from the body.

Some specialists who work with radioactive isotopes use this method to remove radiation from their body. For an abnormally high level of radiation exposure one can use this method three times a week for one month.

⁵⁷ Barth, J., Mikalis, A.N., ;Harris, J.Y., Bruckner, B.H. "Evaluation of Clays as Binding Agents for Reduction of Radionuclides in Milk. Effect of Belle Fourche Bentonite on excretion in lactating goats," *J. Agr. Food Chem.* 17: 1347-9 (Nov-Dec 1969).

Dr. Parcels claimed that the best time for this type of bathing was at night when the body was geared to detoxification, and said you should only do one bath per day. Don't mix the ingredients from different baths together, but follow Dr. Parcels instructions for one bath at a time. You can alternate the baths on different evenings if you feel you have need for them all, though in a severe case you might do a baking soda bath in the morning and one bath at night.

The radiation detoxification baths can be continued until you feel relief from radiation symptoms though you should remember to use common sense and cut back or discontinue them if they are too strong or unpleasant.

It goes without saying that you should be careful not to drink from the toxic bathing water – keep your head above the water line and do not add any bubble bath, soap or other shampoos that may hinder the effect of the detox.

These are powerful ways to detox through the skin that should not be underestimated in a time of a nuclear fallout.

Ionizing Footbaths

There is an ionizing footbath that I use at the [Da Vinci Holistic Health Centre](#) that I run in Larnaca, Cyprus. The Focus Ionizing Footbath sets up a type of osmosis condition, which drains out toxins within the body. When you first place your feet into the water and activate the FOCUS machine, the water is clear. By the end of the 35 min. bath, the water has changed in colour due to the cellular waste & impurities present in the water.

Impurities are pulled from the body, improving the body's natural resilience. Cells photographed under darkfield microscope demonstrate marked improvements after just one bath. The cells are free-floating and rounded, appearing much more hydrated and oxygenated. The cell walls are clearer and less dense and work with the water in your body, activating it, energizing and balancing the meridians.

The Focus Footbath has also been scientifically tested for its efficacy in eliminating Mercury with good results.

Regular use of the FOCUS bath can achieve:

- Cellular Cleansing
- Anti-aging
- Strengthened Immune System
- Clearer Skin Complexion
- Activates body's natural elimination system, including lymph node
- Joint/ Pain Relief
- Weight Loss
- Increased Circulation
- Reduced Stress & Fatigue
- Reduced Swelling/Inflammation

- Improved Joint Stiffness

When I was first offered the Focus Ionizing Detox bath I had my doubts about its efficacy, so a pilot study with 18 clinical patients was conducted. The FOCUS footbath clearly showed that it can eliminate mercury from the feet as in nearly all cases there was a mean percentage increase in the post-sample compared to baseline of 54.51% (range of 3.25 to 157.11 percent).

Of the 34 people participating, 16 people took HMD®, a natural chelating agent 1.5 hours before entering the footbath. For the HMD® group, the mean percentage increase was 412.99%, with a range of 3.10 to 4697.39%. This is statistically higher than the group that used the FOCUS footbath without taking the HMD® ($p=0.0001\%$).

It is clear from the preliminary data that the FOCUS footbath is certainly facilitating the removal of mercury from the body in nearly every patient tested.

One of the factors that facilitated the excretion of mercury in the footbath was a natural heavy metal chelator called HMD® - the mean percentage increase increased to 412.99%, a statistically significant increase. This patent-pending natural compound has been tested in double-blind, placebo controlled studies with 350 people and has been shown to work effectively at eliminating many different heavy metals, including mercury. People using the footbath can also be encouraged to take the HMD® throughout their detoxification protocol.

Videos to watch:

[Focus Ionising Footbath](#)

SODIUM BICARBONATE (BAKING SODA)

Dr. Mark Sircus⁵⁸ has written an excellent book on Sodium Bicarbonate entitled: [“Bicarbonate and Magnesium Medical Baths.”](#) Here are some excerpts from his writings, but it is highly recommended that you purchase the book too for more details.

The oral administration of sodium bicarbonate diminishes the severity of the changes produced by uranium in the kidneys. The kidneys are usually the first organs to show chemical damage upon uranium exposure. Old military manuals suggest doses or infusions of sodium bicarbonate to help alkalize the urine if this happens. This makes the uranyl ion less kidney-toxic and promotes excretion of the nontoxic uranium-carbonate complex.

Dr. Mark Sircus has also written a second edition entitled: [Sodium Bicarbonate: Rich Man's, Poor Mans Cancer Treatment.](#)

So useful and strong is sodium bicarbonate that at Los Alamos National Laboratory in New Mexico, researcher Don York has used baking soda to clean soil contaminated with uranium. Sodium bicarbonate binds with uranium, separating it from the dirt; so far, York has removed as much as 92 percent of the uranium from contaminated soil samples. The United States Army recommends the use of bicarbonate to protect the kidneys from radiation damage.

Dr. Mark Sircus continues to say: “Sodium bicarbonate can safely remove paint, grease, oil and smoke residue, decreasing workers' exposure to harsh chemicals and eliminating much of the hazardous waste associated with other cleaners. “Sodium bicarbonate is able to clean in areas where other substances pose fire hazards, because baking soda is a natural fire extinguisher,” says Kenneth Colbert, a general manager for Arm & Hammer. This is the reason it's used by oncology centers to control chemo agent spills and it's actually used intravenously to protect patients from the hazardous toxicity of chemotherapy.”

“Uranium is one of the only metals that get significant bonding from bicarbonate. Just flushing a lot of bicarbonate through the system, along with whatever kidney support you are going to use, will be very helpful, writes Dr. Chris Slade. There is no better therapy for radiation sickness than intense sodium bicarbonate (baking soda) and magnesium baths with the appropriate clay added in. Even sodium thiosulfate can be added to these baths and that instantly neutralizes any chlorine in the bath water while simultaneously providing sulfur for the vital sulfur pathways.”

⁵⁸ <http://blog.imva.info/medicine/treatments-nuclear-contamination>

Bicarbonate and Nuclear Fallout

Dr Sircus continues in his essay to say: “If the bombs start dropping anywhere on earth, or if you live near a nuclear plant, you will want to have a large amount of sodium bicarbonate on hand. Minimum stocks should be 25 or 50 pounds. Normally we recommend someone start with using one pound of bicarbonate in a bath but that could easily be two or three pounds in an emergency situation. You will also need a lot of magnesium salts and the very best and most penetrating of them is the magnesium chloride in the form of magnesium bath flakes. Dead Sea salt is also fine for this application because it is high in magnesium.”

Exposure to radiation causes a cascade of free radicals that wreak havoc on the body. Radiation decimates the body's supply of glutathione. Nebulization is one of the best ways to quickly increase glutathione levels as is the use of glutathione rectal suppositories. The main cancer risk from inhaled uranium oxide and other airborne radioactive particles is from tiny insoluble particles lodged deep in the lungs. That's a good reason to nebulize both glutathione and bicarbonate directly into the lungs and one must wonder why governments and health officials haven't sponsored this.

Uranium oxide can be inhaled by soldiers and civilians, it sticks to the lining of the lungs, it is taken up by cells of the immune systems and gets into lymph glands, bone, brain, hormone producing glands, ovaries and testes. It stays in these organs for many decades and is only very slowly excreted in urine. Nebulization topically treats the lung tissues allowing for best effect on contaminated lung tissues.

Uranium-238 is being eliminated in the hair using HMD® (heavy metal detox) protocols; to date there is no natural chelating agent known to mobilize and eliminate uranium-238 from body tissues apart from [HMD®](#).

PROTECTING AGAINST RADIATION WITH FATTY ACIDS

In the field of radiation therapy, there is a man whose work is hardly known, famous cancer doctor Emanuel Revici, MD. In a lecture entitled “The Influence of Irradiation Upon Unsaturated Fatty Acids,” presented in London in 1950 to the Sixth Annual Congress of Radiology, Dr. Revici explained that the effects of severe radiation poisoning tend to increase over time due to a cascading effect of more and more fatty acids becoming abnormal. His paper shows that abnormally-conjugated trienic fatty acids (leukotrienes) induce radiation illness.

Revici was one of the first pioneers to do substantial research in this area, concentrating on the study of lipids and radiation. In this particular lecture and in his monographs, Revici correctly described the inflammatory effects of leukotrienes (trienic conjugated fatty acids) and their derivation from arachidonic acid, research that was paralleled decades later by Bengt Samuelsson,⁵⁹ who won a Nobel Prize for the discovery.

What happens is that if there is a fatty acid imbalance, a small bit of radiation damage will actually grow worse over time until the effects are unstoppable. Revici developed an **oxalic acid index** to measure abnormal fatty acids in the body, and determined that once this index reached a critical level, death was certain.

When the USSR suffered the Chernobyl accident and many doctors were volunteering their services to perform bone marrow transplants for the radiation victims, Revici felt that the approach of using bone marrow transplants to save Soviet radiation victims would not work but was actually doomed to failure because, “So long as (abnormal fatty acids) are in the body, they will act against transplanted bone marrow cells.”

In other words, for the acute radiation sickness *hematopoietic syndrome* where bone marrow transplants are considered, Revici basically said you have to check fatty acid conditions to see whether that approach would be successful.

Research on animals has suggested that a variety of cytokines might be useful for the hematopoietic syndrome that often requires this bone marrow therapy, but most of them are not currently available or yet approved for human use.

Anyway, Revici believed that the best antidote for the radiation poisoning was a fatty acid antagonist and he developed a product, **n-butanol**, which has been proved particularly useful in treating radiation burns.

If you suffer from radiation poisoning and you don't do anything to correct the fatty acid imbalance in your body, then even if you take neutropenia (white blood cell) stimulating growth factors, as just discussed, you may still die because you

⁵⁹ <http://www.nmdb.com/people/511/000132115/>

are not treating a crucial part of the equation. You need to work on your fatty acid imbalance.

In the literature, there is very little information on fatty acid rancidity due to radiation exposure and how to counter it other than through the use of antioxidants (such as vitamin E, the thiol antioxidants, vitamin C, etc.), many of which you will naturally get through the radiation diet. We do know that **natural beta-carotene** protects against the lipid oxidation and acts as a fatty acid antioxidant radioprotector, but the big thing is the fatty acid imbalance itself.

Dr. Revici,⁶⁰ years ago, stated that **cod liver oil fatty acids** had a high anticancer value and this received corroboration at the 1987 American Cancer Society Science Writers Seminar, where Dr. Otto Plescia (Professor of Immunochemistry at Rutgers University) concluded that a diet with "inclusion of omega-3 fatty acids abundant in certain fish oils, reduces the risk of breast cancer." In terms of radiation, mice exposed to large doses of radiation survived 50-100% longer than normal if fed cod liver oil.

Just as Revici predicted, **cod liver oil** is one of the most often recommended oils for the purposes of rebuilding one's health. Another often cited oil is **olive oil**, and two sets of experiments in Spain (Ilbanes and Castellanos) showed that olive oil fully protected rats against increasing doses of damaging X-ray irradiation.⁶¹ For olive oil, you want the virgin cold pressed oil.

Like Revici, Hopewell has also studied polyunsaturated fatty acids as a means of treating chronic radiation injuries⁶² but perhaps the most interesting work in this area has been performed by the German biochemist, Dr. Johanna Budwig, who was an expert on fats and oils.

Dr. Johanna Budwig worked for 30 years to discover the importance of fatty acids in the diet and is world famous for the development of a diet that uses organic, raw, cold-pressed **flaxseed oil** and **low-fat cottage cheese** to treat cancer. The Budwig diet formula uses a ratio of two tablespoons of flaxseed oil mixed with one-quarter cup of low-fat cottage cheese over approximately a three-month period to reduce tumors, fight weakness and treat the anemia that often appeared in cancer patients. Therefore it treats symptoms similar to those who suffer from radiation injury.

⁶⁰ Revici, Emanuel, *Research in Physiopathology as a Basis of Guided Chemotherapy with Special Application to Cancer* (American Foundation for Cancer Research, New York, 1961).

Royal, Gladys, *Modern Nutrition*, (Pasadena, California), November 1960, p. 11.

⁶¹ "Dietary polyunsaturated fatty acids: impact on cancer chemotherapy and radiation." *Altern Med Rev.* 2002 Feb;7(1):4-21)

⁶² Hopewell, JW. Modifying radiation injury to normal tissues: new opportunities, *Frontiers of Radiation Therapy and Oncology*, 32, 9-20, 1999.

OTHER RECOMMENDATIONS

Natural Geiger Counter: There is a plant that is a natural Geiger counter. The spiderwort plant is so sensitive to changes in radiation levels (its petals change color upon exposure) that it's often used as a natural radiation detector (dosimeter), just as they use canaries in mines as detectors of poisonous gas. Some people like knowing that they have an ongoing monitoring system for radiation in the environment. For further tips you may also want to see an article called '[Treatments for Nuclear Contamination](#)'.

Let's all stay happy and healthy,



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