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Radiation Levels Up to 1,000 Times Higher than Current "Safety Levels"

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Theme: Environment, Science and Medicine

The U.S. federal drinking water standard for radioactive Iodine-131 is 3 picocuries per liter, but levels exceeding that by as much as 181 times have been detected in rainwater sampled in California, Idaho, Minnesota, Ohio, Pennsylvania and Massachusetts.

Radioactivity has also been found in milk from Spokane, Washington.

Safe Levels of Radiation?

The government says there is no danger, as these levels (even levels in rainwater above drinking water standards) are "safe". Specifically, they explain that the exposure is only short-term, while federal drinking water standards assume a constant level of radiation over the course of a year.

In addition, not all of the radiation from the rainwater will end up in the drinking water supply. So – say federal and state governments – there is no danger from short-term exposure to such levels of radiation.

But as I pointed out recently:

> Physicians for Social Responsibility notes:
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> > According to the National Academy of Sciences, there are no safe doses of radiation. Decades of research show clearly that any dose of radiation increases an individual's risk for the development of cancer.
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> > "There is no safe level of radionuclide exposure, whether from food, water or other sources. Period," said Jeff Patterson, DO, immediate past president of Physicians for Social Responsibility. "Exposure to radionuclides, such as iodine-131 and cesium-137, increases the incidence of cancer. For this reason, every effort must be taken to minimize the radionuclide content in food and water."
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> > "Consuming food containing radionuclides is particularly dangerous. If an individual ingests or inhales a radioactive particle, it continues to irradiate the body as long as it remains radioactive and stays in the body,"said Alan H. Lockwood, MD, a member of the Board of Physicians for Social Responsibility.
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> Radiation can be concentrated many times in the food chain and any consumption adds to the cumulative risk of cancer and other diseases.

John LaForge notes:

> The National Council on Radiation Protection says, "... every increment of radiation exposure produces an incremental increase in the risk of cancer." The Environmental Protection Agency says, "... any exposure to radiation poses some risk, i.e. there is no level below which we can say an exposure poses no risk." The Department of Energy says about "low levels of radiation" that "... the major effect is a very slight increase in cancer risk." The Nuclear Regulatory Commission says, "any amount of radiation may pose some risk for causing cancer ... any increase in dose, no matter how small, results in an incremental increase in risk." The National Academy of Sciences, in its "Biological Effects of Ionizing Radiation VII," says, "... it is unlikely that a threshold exists for the induction of cancers ...."
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> Long story short, "One can no longer speak of a 'safe' dose level," as Dr. Ian Fairlie and Dr. Marvin Resnikoff said in their report "No dose too low," in the Bulletin of the Atomic Scientists.

And Brian Moench, MD, writes:

> Administration spokespeople continuously claim "no threat" from the radiation reaching the US from Japan, just as they did with oil hemorrhaging into the Gulf. Perhaps we should all whistle "Don't worry, be happy" in unison. A thorough review of the science, however, begs a second opinion.
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> That the radiation is being released 5,000 miles away isn't as comforting as it seems.... Every day, the jet stream carries pollution from Asian smoke stacks and dust from the Gobi Desert to our West Coast, contributing 10 to 60 percent of the total pollution breathed by Californians, depending on the time of year. Mercury is probably the second most toxic substance known after plutonium. Half the mercury in the atmosphere over the entire US originates in China. It, too, is 5,000 miles away. A week after a nuclear weapons test in China, iodine 131 could be detected in the thyroid glands of deer in Colorado, although it could not be detected in the air or in nearby vegetation.
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> The idea that a threshold exists or there is a safe level of radiation for human exposure began unraveling in the 1950s when research showed one pelvic x-ray in a pregnant woman could double the rate of childhood leukemia in an exposed baby. Furthermore, the risk was ten times higher if it occurred in the first three months of pregnancy than near the end. This became the stepping-stone to the understanding that the timing of exposure was even more critical than the dose. The earlier in embryonic development it occurred, the greater the risk.
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> A new medical concept has emerged, increasingly supported by the latest research, called "fetal origins of disease," that centers on the evidence that a multitude of chronic diseases, including

cancer, often have their origins in the first few weeks after conception by environmental insults disturbing normal embryonic development. It is now established medical advice that pregnant women should avoid any exposure to x-rays, medicines or chemicals when not absolutely necessary, no matter how small the dose, especially in the first three months.

“Epigenetics” is a term integral to fetal origins of disease, referring to chemical attachments to genes that turn them on or off inappropriately and have impacts functionally similar to broken genetic bonds. Epigenetic changes can be caused by unimaginably small doses – parts per trillion – be it chemicals, air pollution, cigarette smoke or radiation. Furthermore, these epigenetic changes can occur within minutes after exposure and may be passed on to subsequent generations.

The Endocrine Society, 14,000 researchers and medical specialists in more than 100 countries, warned that “even infinitesimally low levels of exposure to endocrine-disrupting chemicals, indeed, any level of exposure at all, may cause endocrine or reproductive abnormalities, particularly if exposure occurs during a critical developmental window. Surprisingly, low doses may even exert more potent effects than higher doses.” If hormone-mimicking chemicals at any level are not safe for a fetus, then the concept is likely to be equally true of the even more intensely toxic radioactive elements drifting over from Japan, some of which may also act as endocrine disruptors.

Many epidemiologic studies show that extremely low doses of radiation increase the incidence of childhood cancers, low birth-weight babies, premature births, infant mortality, birth defects and even diminished intelligence. Just two abdominal x-rays delivered to a male can slightly increase the chance of his future children developing leukemia. By damaging proteins anywhere in a living cell, radiation can accelerate the aging process and diminish the function of any organ. Cells can repair themselves, but the rapidly growing cells in a fetus may divide before repair can occur, negating the body’s defense mechanism and replicating the damage.

Comforting statements about the safety of low radiation are not even accurate for adults. Small increases in risk per individual have immense consequences in the aggregate. When low risk is accepted for billions of people, there will still be millions of victims. New research on risks of x-rays illustrate the point.

Radiation from CT coronary scans is considered low, but, statistically, it causes cancer in one of every 270 40-year-old women who receive the scan. Twenty year olds will have double that rate. Annually, 29,000 cancers are caused by the 70 million CT scans done in the US. Common, low-dose dental x-rays more than double the rate of thyroid cancer. Those exposed to repeated dental x-rays have an even higher risk of thyroid cancer.

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Beginning with Madam Curie, the story of nuclear power is one where key players have consistently miscalculated or misrepresented the risks of radiation. The victims include many of those who worked on the original Manhattan Project, the 200,000 soldiers who were assigned to eye witness our nuclear tests, the

> residents of the Western US who absorbed the lion's share of fallout from our nuclear testing in Nevada, the thousands of forgotten victims of Three Mile Island or the likely hundreds of thousands of casualties of Chernobyl. This could be the latest chapter in that long and tragic story when, once again, we were told not to worry.

Internal Emitters

Proponents of nuclear energy and nuclear weapons argue that we can't eliminate all man-made radioactivity, that nuclear power and weapons are good, and that we need standards to promote a logical cost-benefit analysis.

But as I noted last week, the current standards are misleading:

> There are, of course, naturally occurring radioactive materials.
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> But lumping all types of radiation together is misleading ... and is comparing apples to oranges.
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> As the National Research Council's Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program explains:
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> > Radioactivity generates radiation by emitting particles. Radioactive materials outside the the body are called external emitters, and radioactive materials located within the body are called internal emitters.
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> Internal emitters are much more dangerous than external emitters. Specifically, one is only exposed to radiation as long as he or she is near the external emitter.
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> For example, when you get an x-ray, an external emitter is turned on for an instant, and then switched back off.
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> But internal emitters steadily and continuously emit radiation for as long as the particle remains radioactive, or until the person dies – whichever occurs first. As such, they are much more dangerous.
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> Dr. Helen Caldicott and many other medical doctors and scientists have confirmed this. See this and this.
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> It is important to note that each individual internal emitters behaves differently. They each accumulate in different places in the body, target different organs, mimic different vitamins and minerals, and are excreted differently (or not at all). Therefore, comparing radioactive cesium or iodine with naturally occurring radioactive substances – even those which can become internal emitters – is incorrect and misleading.

As radiation expert Dr. Chris Busby writes:

Since the Fukushima accident we have seen a stream of experts on radiation telling us not to worry, that the doses are too low, that the accident is nothing like Chernobyl and so forth. They appear on television and we read their articles in the newspapers and online. Fortunately the majority of the public don't believe them.

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Patients receiving a course of radiotherapy usually get a dose of more than 20,000 mSv to vital healthy tissue close to the treated tumour. This tissue survives only because the treatment is spread over many days giving healthy cells time for repair or replacement. A sea-change is needed in our attitude to radiation, starting with education and public information.

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External irradiation is not the problem. The problem is internal irradiation. The Iodine-131 is not in the whole body, it is in the thyroid gland and attached to the blood cells: hence the thyroid cancer and the leukaemia. And there is a whole list of internal radioactive elements that bind chemically to DNA, from Strontium-90 to Uranium. These give massive local doses to the DNA and to the tissues where they end up. The human body is not a piece of wire that you can apply physics to. The concept of dose which [Pollyannas use] cannot be used for internal exposures. This has been conceded by the ICRP itself in its publications. And in an interview with me in Stockholm in 2009, Dr Jack Valentin, the ex-Scientific Secretary of the ICRP conceded this, and also made the statement that the ICRP risk model, the one used by all governments to assess the outcome of accidents like Fukushima, was unsafe and could not be used. You can see this interview on the internet, on www.vimeo.com.

Why is the ICRP model unsafe? Because it is based on "absorbed dose". This is average radiation energy in Joules divided by the mass of living tissue into which it is diluted. A milliSievert is one milliJoule of energy diluted into one kilogram of tissue. As such it would not distinguish between warming yourself in front of a fire and eating a red hot coal. It is the local distribution of energy that is the problem. The dose from a singly internal alpha particle track to a single cell is 500mSv! The dose to the whole body from the same alpha track is 5 x 10-11 mSv. That is 0.000000000005mSv. But it is the dose to the cell that causes the genetic damage and the ultimate cancer. The cancer yield per unit dose employed by ICRP is based entirely on external acute high dose radiation at Hiroshima, where the average dose to a cell was the same for all cells.

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The last thing [proponents of nuclear weapons and nuclear energy] wanted was the doctors and epidemiologists stopping their fun. The IAEA and the World Health Organisation (WHO) signed an agreement in 1959 to remove all research into the issue from the doctors of the WHO, to the atom scientists, the physicists of the IAEA: this agreement is still in force. The UN organisations do not refer to, or cite any scientific study, which shows their statements on Chernobyl to be false. There is a huge gap between the picture painted by the UN, the IAEA, the ICRP and the real world. And the real world is increasingly being studied and reports are being published in the scientific literature: but none of the authorities responsible for looking after the public take any notice of this evidence.

The Politics Behind the "Science"

I wrote to professor Busby and asked him if the faulty standards – based on external

emitters – applied to radiation standards for drinking water, milk and food as well. Specifically, I asked:

> Are the current "safe levels" of radioactivity set by governments for drinking water, milk and food based upon external emitters? Or upon internal emitters? I know that the Committee Examining Radiation Risks of Internal Emitters (CERRIE) [an independent Committee established by the UK Government in 2001, in which Dr. Busby participated] looked at this issue, but I can't figure out whether governments ever changed their "safe" levels for food and beverages based on internal emitter science.

I mentioned the radioactive iodine found in rainwater in the U.S. and pointed out that the Canadian government is refusing to test milk for radiation – which is guaranteed to create internal emitters of any radiation when we drink it – based on the statement that radiation levels in the air are not all that high:

Dr. Busby responded:

> The current risk model is based upon external acute radiation at high dose rate, the Japanese A-Bomb [i.e. from measurements of the effect of uniform, external radiation on the residents of Hiroshima and Nagasaki]. It is incorrect for internal and this was discussed at CERRIE but the implications were so alarming that the government sacked the Environment minister Michael Meacher who set up the committee and shut it down before it had finished (or even started) the research it was doing and also brought legal threats to bear on members so the final report is a whitewash, even though it concedes the problem exists and that the error may be as high at 10-fold. In fact, there is plenty of data and studies that show the error is from 500 to upwards of 1000. But this is not for all radionuclides, only some. The ECRR (www.euradcom.org) has studied this issue and provided risk model for internal emitters.

Dr. Busby explained that the standards for radioiodine are about 20 times higher than they should be when it will be taken inside the body, and for certain radioactive particulates, up to 1,000 times higher than is safe.

Note: Even though current standards are way too high, the EPA is trying to raise the current standards much higher. Just as with the Gulf oil spill and other environmental (and economic) problems, governments are fudging the "science" (and suppressing basic information) to fit a political agenda.

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