

A Physician Comments about Radiation and CFIDS/ME and the NCF Responds
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Dear NCF:

I was reading an on-line internet post from one of the CFIDS/ME web forums. A physician was asked specifically about the NCF's research regarding the connection between radiation exposure and the subsequent development of CFIDS/ME. This physician went on to publicly state, "I am supposed to be properly educated about this, as a professor of medicine and immunology who worked on the role of mutation in immune disease. The radiation theory looks to be a non-starter to me. All the suggestive connections fall apart on inspection of detail. For a start the epidemiology is wrong."

Does the NCF have any response to these comments and if so, what are they? Could you please elaborate for me and for the CFIDS/ME community at large? Thanks!

NCF Response:

As the Medical Director for the NCF, let me begin with a general statement first. In medicine, most physicians have their own opinions regarding diagnostics and therapeutic interventions on behalf of their patients. This is often dictated by their training or specialty, their clinical experience, etc. We get it and we can appreciate and respect any and all ideas that are currently brought forth by physicians regarding CFIDS/ME. By looking at the NCF's scientific efforts over the last two decades, it is easy to see that funding medical research has clearly dominated our efforts. As you are likely aware, thus far we have directed over \$ 4 million dollars in highly selective grants to achieve our research goals. Every single day we make "iterative corrections" to help us to continue to point our ship in the direction that we feel will assist us in unraveling some very specific underpinnings for this disease process. In all fairness, this is the only way that we feel we can possibly conquer this devastating disease. It has always been and it continues to be OUR approach towards an expeditious solution to this very serious problem that all of us as patients have been confronted with, myself included as a 30 year veteran of this disease. Ultimately, we aim to apply all of our gained knowledge and experience towards much needed directed therapies as well as precision diagnostic testing.

Let me continue. I would be remiss if I didn't take a moment to note the following. It really is important to remember that every Ph.D. we have encountered and subsequently provided grant money to also has their own opinions regarding CFIDS/ME. As such, their ideas should be considered to be just as valid and hopefully as equally respected among the scientific community. Belief has nothing to do with anything. Under these circumstances where time is truly precious, the science is everything! I often remind myself that medicine is but one part of the world of science just as, for example, engineering is. No one has a corner on all scientific knowledge, ourselves included. When I look back, it is important to recognize that the NCF has provided grants to pathologists, virologists, cell biologists, biochemists, physicists etc. You get the picture. Everyone comes to the table trying to solve this extraordinary puzzle with a vision that is built upon their own skill set. Fortunately, we view this as a true strength and certainly not a weakness in our attempt to arrive at a solution.

Let's move on now to provide some specifics. The physician stated that the radiation theory (of CFIDS/ME) is a non-starter for them. OK....Does this physician even realize that the very first

connection between radiation exposure and development of CFS, as it was referred to, came from scientists who studied the Chernobyl disaster that occurred in 1986? I would refer this physician to the numerous references to this in the medical literature - some of which we will list for simple convenience but is by no means considered exhaustive [1-7].

Let's look at several important quotes that can easily be extracted from this literature:

[A] "Chronic Fatigue Syndrome (CFS) is a one of the most important consequences of radioecological disaster resulting in an interaction of different hazardous environmental factors - low and very low doses, stress etc. 26% clean-up workers exposed to doses below 0.3 Sv met the CFS diagnostic criteria (Loganovsky, 2000, 2003). CFS frequency decreased (from 65.5% in 1990 - 1995 to 10.5% in 1996 - 2001) and Metabolic Syndrome X (MSX) frequency increased (from 15 to 48.2%). CFS and MSX are considered to be the stages of another neuropsychiatric and organic pathology development (Kovalenko and Loganovsky, 2001). CFS can be considered as environmentally induced predisposition and vestige of forthcoming neurodegeneration, cognitive impairment, and neuropsychiatric disorders (Volovik et al, 2005)."

[B] "I will review the evidence which indicates that radiation, has a direct impact on the central nervous system, particularly affecting the left hemisphere. Further low level radiation, at the cellular level, is much more destructive of cell membranes than high level radiation by a factor of some 3000. This explains the increased incidence of schizophrenia and chronic fatigue type syndrome observed in exposed populations in Chernobyl, Hiroshima and Nagasaki. Following exposure to radiation abnormal EEG changes have been reported in France, the Ukraine, Russia and Japan. Also an excess of epilepsy, intellectual retardation, and neuropsychiatric disorders have been found by Russian and Ukrainian investigators. Further children irradiated in-utero in the 4th - 5th months of gestation have EEG changes in the left hemisphere and reduced verbal IQ when tested at the age of eleven. Interestingly low dose radiation in infancy for the treatment of cutaneous haemangioma and tinea capitis (ringworm) leads to a deficit of verbal, but not spatial cognitive functions in late adolescence together with an increase in psychosis, personality disorders, intellectual retardation and epilepsy fifteen to twenty years later. What is more soldiers exposed to depleted uranium particles in the First Gulf War exhibited a - Gulf War Syndrome - with symptomatology similar to that seen in the chronic fatigue/fibromyalgia syndromes with neuronal changes in the left basal ganglia. In conclusion the evidence suggests not only that radiation directly disrupts the central nervous system, but that paradoxically low level radiation is the most damaging. The psychological and social psychosomatic stress model which WHO emphasize as the cause of the widespread and increasing morbidity in populations exposed to radiation is in fact predominantly the result of radiation induced neuropsychiatric disturbances. This explains the increased incidence of schizophreniform and chronic fatigue type syndromes through disruption of left hemispheric cortico-limbic systems. The peculiar susceptibility of the left hemisphere to ionizing radiation will be discussed."

"Dr. Flor-Henry's scientific interest lies in neuropsychiatric clinical pictures in people exposed to radioactive radiation. Experts' opinions are rather controversial. Some scientists attribute neuropsychiatric diseases to unspecific stress in the people exposed to radiation in Chernobyl. Others, however, have observed organic cerebral changes among those affected over many years, which can be objectified in an EEG (electroencephalogram). Psychiatrists like Zhavoronkova from Moscow or Loganovsky from Kiev, Ukraine, have observed an increase in clinical syndromes like schizophrenia and chronic fatigue, which prevail among a high percentage of radiated clean-up workers, together with depressive clinical pictures (that can result in suicide). These diseases of the central nervous system (CNS), which principally contribute to invalidity among clean-up workers of Chernobyl, go

hand in hand with cerebro-organic changes, which are mainly seen in the left hemisphere of the cerebrum (in right-handed people). The syndromes furthermore manifest themselves in the phenomenon of premature aging: studies show that these neurological clinical pictures appear even earlier and to a more severe extent, the younger the person is at the time of exposure to radioactive radiation. Similar clinical syndromes, which are accompanied by EEG changes in the left cerebral hemisphere, are also observed among clean-up workers, who have suffered from acute radiation syndrome. Dr. Flor-Henry was surprised that these psychiatric diseases or EEG changes were not found among the Russian veterans of the (lost) Afghanistan war; these soldiers were, after all, also subjected to a great deal of stress and not celebrated like heroes in their homeland, much different to the Chernobyl clean-up workers. New technologies like magnetic resonance tomography (MRT), EEG and positron emissions tomography (PET) facilitate the proof that cerebral changes among Chernobyl clean-up workers and veterans of the first Gulf War or the war in Bosnia are extremely similar to each other. Just recently, previously unidentified symptoms among veterans of the Gulf War in the USA have been juristically recognised as a pathological entity. Modern wars are characterised by their massive use of projectiles containing 99 % of Uranium238 (so-called depleted uranium, DU). Large amounts of uranium238 oxide are released into the air on detonation, which, as a dust, is capable of infiltrating the human organism via inhalation and damaging lung alveoli. This results in chronic radioactive radiation, which may be weak, but signifies continual exposure to the tissue cells. Dr. Flor-Henry has established that victims, who are exposed to uranium238, develop similar neuropsychiatric syndromes to survivors of the atomic bomb drops on Japan 1945. Dr. Flor-Henry discusses the connections, which exist between neurological diseases and the anatomical localisation of cerebro-organic changes. He particularly deals with the topic of left hemispheric degeneration, whereby external exposure to radiation or incorporated radionuclides (like, for example micro or nano particles deriving from uranium and plutonium) principally infiltrates the organism via the air passages. The affinity between diseases in Chernobyl clean-up workers and those of the victims exposed to uranium238 has to be associated with chronic, radioactive radiation in the low-dose range.”

Next, from the question initially posed to the NCF, this physician went on to state that all the suggestive connections fall apart on inspection of detail. Well, if what was briefly written above isn't a strong enough opinion regarding radiation exposure and the subsequent development of CFIDS/ME, perhaps several other points are in order:

[C] At the 2018 Invest in ME Research International Conference, Dr. Ron Davis of Stanford University, who is also the Scientific Advisory Board Director for the Open Medicine Foundation, had identified uranium in many patient hair samples [8]. Dr. Davis commented, "...uranium. That's probably environmental. I don't know where that comes from and we don't know the medical consequences of the uranium.”

Well, checking the medical literature yielded the following: "There can be no argument, however, regarding a connection between an elevated concentration of uranium in the hair and exposure of the hair to uranium....When the focus is on uranium exposure rather than uranium intoxication, the determination of uranium concentrations in hair can be a useful tool in the large-scale screening of populations for possible exposure to uranium. [9]"

The NCF is certainly aware of some of the medical consequences of uranium. One important and direct connection involves the work accomplished by Dr. Asaf Durakovic while he was at AFRRI (Armed Forces Radiobiology Research Institute) [10]. Interestingly, AFRRI's mission is to preserve and protect the health and performance of U.S. military personnel through research and training that advance understanding of the effects of ionizing radiation.

In this publication, Dr. Durakovic discusses radionuclide inhalation, ingestion, skin absorption as well as exposure via wounds. Furthermore, he goes on to provide details regarding internal uranium exposure. In his chapter from the book, *Military Radiobiology*, I have included the following extracted quote: "Uranium isotopes have different metabolic behaviors in the body, depending on their physical forms. The ingestion of uranium isotopes results in relatively low absorption (1-5%). This absorbed dose is rapidly excreted through the kidneys. Other routes of internal contamination include inhalation or direct entry into the body fluids through the skin and contaminated wounds. The critical organ for uranyl salts (U-VI) is the bone, while uranous salts (U-IV) are retained in the skeleton in a much smaller quantity. Soluble uranium (²³⁸U) is rapidly eliminated through renal excretion. Less soluble compounds of uranium, particularly when enriched with ²³⁴U and ²³⁵U, are primarily retained in the bone or in the lung if inhaled. Soluble uranium compounds cause mainly chemical damage to the proximal convoluted tubules of the kidneys, with resulting albuminuria, hematuria, hyaline and granular casts, azotemia, and tubular necrosis. Renal recovery even after exposure to high levels of uranium is quite common and additional exposures seem to cause less damage to the kidney after its initial recovery. Urine bioassay should be routinely performed in any case of exposure to uranium compounds."

Allow me to get sidetracked just a little bit because it is critically important to note that Dr. Asaf Durakovic shares office space with Dr. David S. Bell, well known CFS/CFIDS/ME specialist from Lyndonville, NY [11]. As you may recall, Lyndonville was home to one of the heavily publicized disease outbreaks from the mid-80's. Durakovic formed the Uranium Medical Research Center (UMRC) to serve as the Medical Research Director. UMRC's homepage on the web shows Durakovic's and Bell's name on the placard for the Lakeview Medical Office which it lists as the main headquarters for UMRC [12]. UMRC is located in Waterport, NY just a few miles away from Lyndonville. UMRC also has an office in Toronto, Canada.

Furthermore, it is important to note that David S Bell M.D.'s son, David E. Bell Ph.D., is listed under the Board and Staff for UMRC [13]. Dr. David E Bell's listing states the following. According to UMRC's website, "David Elijah Bell is a medical anthropologist who specializes in international public health, environmental contamination, low-dose irradiation, and controversial epidemiology. His ongoing research includes degree of attributable illness from depleted uranium exposure in Gulf War Syndrome, and the role of low-dose irradiation in experiences of Chronic Fatigue Syndrome. He is interested in both genomic aberration and oxidative stress associated with the formation of free radicals. Sociocultural research examines the sociopolitics of contamination and the anxiety of uncertain or controversial illness, emphasizing that such anxiety will have both cultural and biological effects significant enough to alter the clinical expression of disease. David's public health background is in emergency preparedness and disaster relief. He has been a volunteer researcher at UMRC since 2004. He has worked with American Gulf War veterans and residents of industrial contamination sites in the Buffalo/Niagara NY region. His field research abroad has included multiple trips to Bosnia/Herzegovina as well as experience with Afghan refugees in Pakistan and experience with Iraqi refugees in Syria."

The NCF also obtained a copy of Dr. David E. Bell's doctoral dissertation for our own information. His dissertation was titled, "Public health controversy of radioactive warfare: Depleted uranium and displaced discourse in Medically Unexplained Chronic Syndromes (MUCS) [14]."

If you find all of this information on UMRC and the Durakovic/Bell/Bell connection rather intriguing, then I suggest you look for a book that was published from Lyndonville, NY titled, “A Primer in the Art of Deception: The Cult of Nuclearists, Uranium Weapons and Fraudulent Science” by Paul Zimmerman [15]. It is 778 pages in length. On the back of the book is the following synopsis: “Both the great Truths and the great Falsehoods of the twentieth century lie hidden in the arcane, widely inaccessible and seemingly mundane domain of the radiation sciences.” Furthermore the author states, “The fallout from nuclear detonations, routine and accidental releases of radionuclides from commercial nuclear power plants and the debris of depleted uranium weapons endanger the health of exposed populations. To cover-up the extent of illness created by these activities, a fraudulent science of radiation effects has been promulgated which forms the basis for current standards of radiation safety. Using scientific fact as the arbitrator for truth, A Primer in the Art of Deception meticulously deconstructs the matrix of lies that to date have successfully run interference for all deeds that scatter radioactivity into the environment. In the chapter from which the book derives its name, government sponsored distortions of known facts surrounding the effects of depleted uranium are exposed. In The Most Heinous Crime in History: The Betrayal of Mankind by the Radiation Protection Agencies, evidence is presented which demonstrates how outdated concepts of radiation effects have been left intentionally uncorrected in order to deceive the general public of the health effects of internal contamination with radionuclides. The Chicanery of the U.S. Radiation Accident Registry unveils the charade sponsored by the Department of Energy that falsifies the extent of radiation accidents and the hazards created when radioactive material is liberated into the environment. In The Harlot of Babylon Unmasked: Fraudulent Science and the Cover-Up of the Health Effects of Depleted Uranium, up-to-date research on the biological effects of depleted uranium is reviewed, exposing the corrupted science incorporated into a number of authoritative texts that have given uranium weapons a clean bill of health. Taken together, these chapters expose the most notorious deception in history, the lie that low levels of internal contamination from nuclear pollution are not a hazard to health.”

It is worth noting that while the NCF was working with the late Dr. Yoshitsugi Hokama, he had studied a map of the Lyndonville area. Hokama had looked across Lake Ontario and had found Port Hope, Ontario Canada. Port Hope lies on the northern shore of Lake Ontario and is home to a very large uranium refining facility [16]. Lyndonville, on the other hand, is on the southern shore of Lake Ontario directly across from Port Hope and separated by 50 miles of water. As a research pathologist, Hokama wondered if the Lyndonville outbreak had anything to do with environmental pollution from either uranium or other radionuclides from Port Hope or elsewhere. Why? By this time, Hokama and the NCF had already looked for internal radiation exposure in our CFIDS/ME patients using the latest urinary radionuclide testing technology. Our strategy was simple. Initially, we didn't know which radionuclides to look for so we decided to cast a wide net in an attempt to identify any and all possible radiation particles. Upon extensive testing, we ultimately identified them to be alpha-radiators. These same patients were then tested for chromosomal damage, by Dr. Henry Heng, to establish a direct radiation exposure and chromosome damage link to CFIDS/ME, thereby creating the formal NCF cohort. This appeared to be in total agreement with the previous findings from Chernobyl scientists.

Ironically, I should also mention that Dr. Durakovic had also utilized Dr. Henry Heng, which the NCF was unaware of at that time, in his radiation research of Gulf War soldiers. The Durakovic/Heng work became an important part of a documentary on the Discovery Channel titled “Conspiracy Test: Gulf War Illness” [17].

Ultimately, as a result of Dr. Heng's research with the NCF, our CFIDS/ME patient cohort exhibited greater chromosomal instability and damage than that identified from the Gulf War soldier's expose

shown on the Discovery Channel's Conspiracy Test. In the medical literature, such alpha-radiation exposure is directly associated with chromosomal instability and damage [18-21].

Lastly, from the question initially posed to the NCF, this physician went on to state that for a start the epidemiology is wrong.

[D] Because I have been discussing many details that involve Lyndonville, let me take a look at the various risk factors associated with that particular outbreak. This work was published by the Monroe County Health Department, the University of Rochester School of Medicine and the Roswell Park Memorial Institute [22]. Dr. David S. Bell was one of the authors.

In the paper titled, "Risk factors associated with Chronic Fatigue Syndrome in a cluster of pediatric cases," the following major/minor symptoms were listed:

Major:

Fatigue (100%)
Headache (100%)
Abdominal pain (100%)
Myalgia/backache (100%)
Pharyngitis (95.2%)
Lymphatic pain (95.2%)
Arthralgia (90.5%)
Neurologic symptoms (85.7%)
Vertigo (61.9%)
Insomnia (38.1%)
Memory loss/poor concentration (66.7%)
Lightheadedness/fainting (9.5%)
Tinnitus (33.3%)
Parasthesias (38.1%)
Aphasia (23.8%)
Fasciculations (38.1)
Choreiform movements (14.3%)

Minor:

Ocular discomfort/photophobia (85.7%)
Facial rash (80.9%)
Dysuria (33.3%)

The greatest risk factors associated with the symptoms listed above, as determined in the Lyndonville outbreak, were (statistical significance $P < 0.0005$ which is highly significant):

Food ingestion of raw milk at any time; raw milk recently; raw eggs.

There was also significance ($P < 0.05$) for:

Exposure to animals in the house – dogs; Home heating source – hot air; Exposure to animals on property – cats; Appendicitis.

If you study any of the Chernobyl literature, one of the problems that was identified was ingestion of contaminated milk. This was due to radiation airborne plumes that deposited radioactive particles onto fields and pastures that animals grazed on, played on etc. In the case of cows, it is well understood that their consumption of radioactive particles from contaminated grass ends up in milk

products [23]. In fact, milk and milk products serve as major routes of radionuclide contamination. Thus, radionuclides are potentially hazardous through internal irradiation. Certainly the same could be said of chickens regarding their environmental radiation exposure to subsequently contaminate the eggs that they produce. Thus for Lyndonville, raw milk and raw egg risk factors could certainly be associated with environmental radiation contamination. A similar argument could be made for dogs and cats that move in and out of the house from contamination that they could have received from being outside. What I find intriguing, is that the hot air home heating source could potentially implicate airborne radiation particles which would represent a serious contamination risk. It would be interesting to know if during the Lyndonville outbreak time period, if Port Hope had any increased radiation releases from its uranium plant? Likewise, were there any releases from any nuclear plants or facilities during that time period? Where does Lyndonville get its water supply from? Is the water supply measured for alpha-radiation or other radionuclides?

Another paper describes the long-term effects of Chernobyl which was described by scientists at AFRRI [24]. According to this paper, "Several psychoneurological syndromes have been reported in the Russian literature as sequelae of Chernobyl. Many of the syndromes are unfamiliar to Western medicine – for example, neurasthenia, vegetative dystonia, neurovegetative circulatory syndrome, and astheno-vegetative syndrome. Asthenia means lack of strength and energy, in other words, weakness and fatigue. Neurasthenia implies a weakness in the central nervous system. Vegetative dystonia refers to an altered tonicity in the vegetative nervous system, an old name for the autonomic nervous system. The neurovegetative circulatory syndrome adds a cardiovascular component – the patients quickly tire on physical effort (fatigability) and suffer dyspnea and tachycardia. This syndrome resembles neurocirculatory asthenia (also called Effort Syndrome), which was prevalent in U.S. and British troops during World War I and was a common long-term effect seen in gas casualties. The symptoms of these psychoneurological syndromes overlap and include fatigue, general weakness, fatigability, headache, sleep disturbances, mood disturbances, irritability, impaired memory and concentration, abdominal pain, nausea, and muscle and/or joint pain. The symptoms also overlap with the Western medical syndromes of fibromyalgia and chronic fatigue syndrome."

As you can tell, many if not most of the symptoms associated with the Chernobyl liquidator exposure match up well with those of the Lyndonville paper. There is much proof from other sources in the medical literature as well.

I wish to end my commentary with one additional but very important paper culled from the medical literature. This paper is titled, "Chronic fatigue syndrome and subsequent risk of cancer among elderly U.S. adults [25]. The National Cancer Institute generated this paper. I believe that this is very important because it provides potential hints regarding epidemiology and because of the seriousness of the potential outcomes for patients. In this paper the authors state, "CFS was associated with an increased risk of non-Hodgkin lymphoma (NHL). Among NHL subtypes, CFS was associated with diffuse large B-cell lymphoma, marginal zone lymphoma, and B cell NHL not otherwise specified. CFS associations with NHL overall and NHL subtypes remained elevated after excluding patients with medical conditions related to CFS or NHL, such as autoimmune conditions. CFS was also associated, although not after multiple comparison adjustment, with cancers of the pancreas, kidney, breast, and oral cavity and pharynx." I suggest that any physician pay particular attention to these potential outcomes so as to become better diagnosticians for their patients. I hope that I have adequately responded to your question.

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