



New Book on Gulf War Illness
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In mid-November, **Gulf War Illness and the Health of Gulf War Veterans: Scientific Findings and Recommendations** was published. It was the work of the Research Advisory Committee (RAC) on Gulf War Veterans' Illnesses, a group of scientists and veterans appointed by the Secretary of Veterans Affairs in 2002. This publication is an up-date of a 2004 publication.

The purpose of the Committee is to "evaluate the effectiveness of government research in addressing central questions on the nature, causes and treatments of Gulf War-related illnesses." (p. 3).

The chief finding of this new publication is that Gulf War illness is a group of medical conditions, which have affected from 25-33 percent of the nearly 700,000 U.S. veterans who fought in the 1991 Gulf War.

Findings in Brief at the beginning of the book, state that of the many factors that may have caused Gulf War illness, the preponderance of evidence indicates that pyridostigmine bromide pills taken by troops to prevent illness or worse from nerve agents, and use of pesticides while in the Gulf War, "are causally associated with Gulf War illness". (p. 1). As for depleted uranium (DU) munitions, Findings in Brief asserts that DU shells along with sand particulates (which might carry DU dust), anthrax vaccine and other possible factors "are not likely to have caused Gulf War illness for the majority of ill veterans." (p. 1)

Part of the reason that DU was not looked on as a primary cause of Gulf War illness is that there is limited information on the subject of harmful effects of DU munitions in a very few human studies. Epidemiologic studies often depend on exposure dose. RAC postulates that soldiers on the field of battle likely knew little or nothing about DU and that the reporting of DU exposure by veterans was one of the least reliable reporting of any of the different hazards that have been implicated in Gulf War illness. (p. 35)

Elsewhere RAC states, "There is little information from Gulf War or other human studies concerning chronic symptomatic illness in relation to DU or uranium exposure. Exposure to DU in post-Gulf War deployments, including current conflicts in the Middle East has not been associated with widespread multisymptom illness. This suggests that exposure to DU munitions is not likely a primary cause of Gulf War illness. Questions remain about long-term health effects of higher-dose exposures to DU however, particularly in relation to other health outcomes." (p. 224)

RAC states that synergism may exist between the various hazardous exposures soldiers were subjected to during the Gulf War. (p. 227) This could include DU.

The RAC Report spends some time on the challenges and problems related to doing a good epidemiological study on Gulf War illness. For one, the symptoms of Gulf War illness do not “fit neatly into well-established categories of disease. The underlying pathophysiology of Gulf War illness is not apparent from routine chemical tests”. (p. 4). Confounding, (a problem arising when dealing with a number of different types of hazardous exposures in a study), the need for adequate sample size and good comparison groups are some of the important factors that can pose challenges in developing good epidemiologic studies. RAC also mentions misclassification biases. There are other problems, such as locating ill veterans who have not been hospitalized; the military also could have problems tracking ill veterans who have left the military.

In the section on DU, RAC reiterates, “Unlike other Gulf War-related exposures,...there is relatively little information available from epidemiologic studies concerning veterans’ exposure to DU and its possible link to Gulf War illness.” (p. 85)

RAC also stated, “The specific types of human health effects that have been described in relation to DU and uranium exposure have little apparent relationship to the pattern of chronic symptoms associated with Gulf War illness”. (p. 88)

There is a discussion of the Camp Doha fire of July 1991 that is indirectly relevant to the issue of DU’s relationship to Gulf War illness. The fire, which broke out at a U.S. military base in Doha, Kuwait, lasted 24 hours and damaged or destroyed more than 100 vehicles and more than 20 buildings. DU munitions were also destroyed in the fire and debris including DU dust and DU fragments was scattered over a wide area. In 2001, the IAEA found high levels of DU in soil that was removed from the area where the fire had taken place.

Canadian members of a combat engineer regiment were encamped next to the U.S. Doha base at the time of the Doha fire. A 2006 ombudsman’s report containing health concerns of members of this regiment indicated that members of the regiment had had significant health problems since their return from the Gulf. Their symptoms included respiratory problems, severe headaches, tumors and seizures. (pp. 95-96). These health problems could have been related to DU exposure at the time of the Doha fire.

RAC’s definition of Gulf War illness – as a combination of “diverse symptoms” – includes chronic headaches and respiratory problems as well as rashes, memory problems, widespread pain, unexplained fatigue and mood changes. (pp. 4, 27). Should they also include cancer or tumors as well as seizures? However these are well-recognized health conditions, not undiagnosed multisymptom health problems.

Notwithstanding, the factors that RAC found to be causal agents, pyridostigmine bromide and pesticides do cause many of the symptoms of Gulf War illness as defined by RAC.

RAC states that Gulf War illness according to their definition has not been seen in soldiers serving in Bosnia or Iraq, leading them to believe that DU was not a primary

cause of Gulf War illness. RAC mentions increases in some cancers, such as bone cancers, lung cancer and malignant lymphomas in the area around Sarajevo. They add, “Researchers were unable to determine whether increased cancer rates in the Sarajevo region may have some relation to DU contaminates, to other war-related nutritional, environmental or psychological factors.....or to smoking which is extremely prominent in the region.” (p. 88). However, other countries in Southeastern Europe also showed increased cancer rates at that time. (p. 88)

Finally, RAC says, “Almost no information is available that directly supports or refutes a possible association between uranium exposure and chronic symptom complexes that resemble Gulf War illness.” (p. 89) They state also that diseases such as lung cancer and renal disease that are thought to possibly result from DU exposure “have thus far not been associated with Gulf War service.” (p. 90-91)

The DU section of the RAC Report has a good section on genotoxic and mutagenic effects of DU. DU is both genotoxic and capable of causing mutations in cellular and animal studies. In addition, a rat study where rats had DU pellets implanted in leg muscle showed that DU could cause leukemia in rats. (p. 98) RAC recommended further research into potential carcinogenic effects of DU as well as the monitoring of exposed populations. (p. 93)

They mentioned the “growing body of research” indicating that uranium liquid compounds and aerosols can lead to changes in genes and cells that have been associated with growth of tumors. (p. 93) They stated however that the dosage and form of DU used in animal or cellular experiments showing that DU could cause damage, were different from the exposure dosage and type of DU, that veterans would have come in contact with during their deployment. (p. 93) The Food and Drug Administration nevertheless has removed drugs from the market as unsafe even though the dosage used in testing was far higher than the dose that humans would have taken of this drug.

RAC discusses at some length V.A. Longitudinal Studies done on a small number of veterans at the Baltimore V.A. Medical Center. The majority of the veterans in the program had been exposed to DU at the time of impact of a shell or shells inside a struck tank or were in the vicinity of the tank at the time – or immediately entered the tank to rescue the crew after the tank was hit; many of these veterans carry embedded DU shrapnel in their bodies. Veterans who sustained possible DU contamination over extended periods while participating in clean-up of contaminated vehicles were by and large not represented in these studies (RAC mentions these soldiers).

Most of these V.A. studies do not have an un-exposed control group, thereby lessening their value with regard to their results and their overall applicability to other veterans.

RAC also mentions two veterans in this program, one of whom was diagnosed with Hodgkins lymphoma and the other of whom had a non-malignant bone tumor. Dr. Melissa McDiarmid, head of the V.A. Longitudinal Studies has avoided mention of these two cases in scientific papers on these studies, which RAC found “puzzling”. McDiarmid’s team maintain that none of the veterans in their cohort are suffering from DU exposure, and are in good health, at least from this point of view.

In fact, these longitudinal studies, which the Pentagon has taken seriously, have retarded research on DU and any serious health effects in humans.

With regard to Gulf War illness overall, RAC criticized **Gulf War and Health**, a series of reports put out by the Institute of Medicine, saying they “provided little information that is directly relevant to health conditions that affect Gulf War veterans at excess rates or their association with Gulf War exposures.” (pp. 53-54) The reports had failed to determine which health conditions “occur(ed) at excess rates and had not drawn any conclusions from animal studies. (p. 54). They added, “The hundreds of findings provided in the IOM reports are largely inconclusive...” RAC stated that these reports had delayed research on Gulf War illness. (p. 55)

RAC made a number of recommendations at the end of the DU section including:

- Epidemiologic studies on health effects in the Gulf War veterans who had suffered the most exposure to DU in the war and to include an unexposed comparison group. RAC suggested that veterans present during the fire at Camp Doha be among those studied as well as members of clean-up teams, including the Camp Doha clean up crews.
- The need for interviews with Gulf War veterans that would probe deeply into their experience and exposure or possible exposure to DU.
- The need for a continuation of monitoring cancer rates and mortality in Gulf War veterans and to examine such rates in veterans exposed to DU and in veterans who were deployed in areas where the greatest concentrations of DU munitions were used. (p. 100)

There were also overall recommendations on Gulf War illness at the end of the RAC Report which included several on future DU research. One was the need to evaluate cancer rates in veterans exposed to DU and the other was on the conduction of “an epidemiologic investigation to evaluate health outcomes in an expanded cohort of Gulf War veterans who had the greatest exposure to depleted uranium during deployment, and an appropriate comparison group. Evaluated health outcomes should include detailed information on symptoms, Gulf War illness, functional conditions, and reproductive outcomes¹” (p. 314)

There is also a chapter on Federal Research on Gulf War Illness and the Health of Gulf War Veterans which is very interesting. Traditionally funding for research came principally from the Department of Defense, from 1994 to about 2002-2004, and studies on psychological stressors in the Gulf War were in the majority. That has changed and now very little money goes into such studies. Most of the funding for research since really 2005 has come from the Veterans Administration. Funding overall has diminished.

In 2006, the VA and the University of Texas Southwestern Medical School (UTSW) in Dallas established a center at UTSW under the direction of Dr. Robert Haley. The

¹ There is a good section on birth defects in the RAC Report showing that Gulf War veterans had children with more birth defects than non-deployed veterans. For the most part, no cause is given.

program will be multidisciplinary and will concentrate on biological effects of Gulf War illness and how this relates to hazardous Gulf War exposures. The program will include an epidemiologic study of a national random sample of Gulf War veterans. Blood and DNA samples will be collected. RAC says, "The UTSW program is the first comprehensive Gulf War research center of its type funded by the federal government and is focused on issues long-identified by the Committee as having high priority". (p. 299). We hope research on DU will be included.

Veterans are still having a difficult time dealing with the VA. They have found that VA physicians and clinicians are unaware of data that they, veterans, have obtained through RAC channels. The Veterans' Health Initiative is a training program for VA doctors who "are not informed about 1) epidemiologic research showing high rates of multisymptom illness in Gulf War veterans", etc. (p. 304) and RAC says that the information given to veterans at the VA "is unacceptably limited and out-of-date". (p. 305) VA doctors tend to minimize Gulf War illnesses.

And what of the health of Gulf War veterans? The Veterans Benefit Administrations Gulf War Veterans Information Service reported that 33 percent of 631,477 veterans who left military service after the Gulf War had filed for disability and been granted it. (p. 306) This was as of February 2008. Few Gulf War veterans with multisymptom illness have filed claims; RAC states that this may be because such claims may be hard to file. (p. 306)

The VA Continuing Medical Education Program says

"Most Gulf War veterans who come to VA for health care or to participate in the VA health registry receive conventional diagnoses and treatments. Most have health problems similar to those experienced by veterans of other eras. However, some veterans report chronic multisymptom illnesses that often are difficult to diagnose. Thus, most of the symptoms reported by veterans in VA registry examinations were found to be caused by conventional illnesses"(p. 304)

Future researchers looking for data on multisymptom illnesses in Gulf War veterans may have a difficult time getting accurate data on veterans suffering from these illnesses at these VA clinics, unless the registry allows for the recording of such health conditions.

So what does the RAC Report, which is some 400 pages long, say about the hazards of DU munitions use? RAC indicates that DU can be harmful, that there is not a proven association between DU exposure and Gulf War illness, and that more research is needed.