

EDITORIAL

Medical Training for Nuclear and Radiological Events: The “Atomic Age” Returns

Dr. Cham E. Dallas



the exposure of personnel, at least partly in hope of determining the appropriate medical response. These activities were said to be justified due to the concern for the apparent imminent use of these terrible weapons.

The fortuitous lack of the use of any nuclear weapons in warfare since 1945 led to a steady decline in interest and training in medical casualties from nuclear and radiological events in civilian institutions, and eventually what little training remained became the singular domain of military personnel. Indeed, radiation expertise in medicine has become almost completely dominated by its use in therapeutic regimens, under tightly controlled conditions. There is now little or no knowledge among nearly all medical and public health personnel concerning the effects generated by environmental radioactivity, which is quite different from therapeutic radiation applications^{2,3}. This lack of knowledge of the appropriate treatment of radiation casualties from environmental exposure is matched by a similar lack of training or even effective protocols for the mass casualty demands of thermal burns and trauma injuries also expected in nuclear war. Indeed, a curious, nearly universal and highly inaccurate culture has developed during this period concerning the effects of radiation, generated by the popular literature and media. This culture, which could be called radiation hysteria, is highly prevalent in the general population, and is also present to a significant extent among medical and public health personnel. For instance, medical workers have been found to be much less willing to respond professionally for radiological events such as a “dirty bomb” than for chemical or biological events⁴.

There was considerable interest generated due to highly publicized nuclear reactor accidents in this interim period, such as in the U.S. at Three Mile Island in 1979 and the much more significant explosion and fire in the Soviet Union at Chernobyl in 1986⁵. While there were no casualties nor appreciable environmental damage at Three Mile Island, the high impact of this renewed interest in radiation was demonstrated by the virtual cessation of new licenses for the construction of additional nuclear

The cycle of interest in medical issues for nuclear and radiological events has gone from high concern at the outset of the “Atomic Age”, eventually declining to a low ebb of knowledge and interest at the turn of the Century, and now moving to a remarkable increase in anticipation of the need for this lesser known field of disaster medicine and public health. After the use of what are now considered relatively small nuclear bombs on Hiroshima and Nagasaki, there was intense interest and training for the casualties expected after these events in military and even civilian medical institutions¹. Widespread drills among the populace for nuclear detonations are still remembered by many Americans, the most famous of which were the old “duck and cover” exercises for children. Various experiments were undertaken in the laboratory and in the field to determine the “effects of nuclear war”, including even

power plants in the U.S. after that time (only recently have some new licenses been approved for new plants to be constructed, the first in 32 years). The accident at Chernobyl released over 100 times as much radioactivity into the air as the Hiroshima and Nagasaki atomic bombs combined, and resulted in the deaths of dozens of firefighters from radiation exposure as well as thousands of subsequent thyroid cancers over the next two decades⁶. Despite the widespread expectation among the general population as well as many medical and public health personnel that radiation-induced birth defects would appear in exposed people, the scientific consensus that emerged over the decades since the Chernobyl accident is that there was no increase in congenital malformations there due to the radiation exposure⁷. However, 30,000 pregnancy terminations occurred in exposed mothers with the single reason of fear of birth defects given as the reason for taking this action⁶. It is interesting to note that while these nuclear reactor accidents generated much popular interest and discernible societal impact, there was no significant change in medical training, emergency management practices, or public health policy as a result.

However, there is now a steadily increasing interest in the management of environmental radiation exposure casualties, and of the mass casualties resulting in the multiple casualty categories from nuclear weapon detonations: thermal burn, laceration and other trauma, radiation, and various combinations of these⁸. A lot of this interest is no doubt related to the simple march of technology, with the access to radiological agents and nuclear weapons steadily and inexorably widening, and to concern for increasingly unstable entities who have the motivation to use this technology against selected populations once this access is gained⁹.

There has been a great increase in the number of federal committees and academic working groups in this area in the last several years relative to the last several decades, and there is an opportunity to bring up the general competencies of medical and public health personnel to meet this increase in renewed interest and probable threat. For example, the Nuclear Radiological Disaster Casualty Management (NRDCM) Working Group is collecting data concerning medical personnel knowledge, training and attitudes toward radiation casualties in an effort toward improving nuclear and radiological casualty treatment. The National Alliance for Radiation Readiness (NARR) is a widespread group with

institutional membership across government, industry and academia for communication, networking, and policy evaluation in this critical area. In line with the ongoing effort to develop common competency sets for emergency management of mass casualties¹⁰, it is necessary to channel this renewed interest in radiological- and nuclear-generated casualty treatment also in this direction. This would enable a concerted effort to prepare governments, medical and public health institutions, and at risk populations for the frightening and possibly staggering consequences of increasingly likely radiation exposure and nuclear war.

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