

# Homeland Security for Physicians

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## ABSTRACT

The apparent strategy of the U.S. federal government, in the event of the use of nuclear weapons on American soil, is to provide for “continuity of government” while civilians largely fend for themselves. Early in the nuclear age, the federal government funded extensive research on nuclear weapons effects and protective measures, but a national civil defense does not exist, partly owing to opposition from some physician groups. Expedient methods could still save millions of lives at minimal cost.

## A Brief History of American Civil Defense and Physician Influence

As older physicians will recall, in the 1950s and 1960s Americans had a high level of awareness that they were targeted by Soviet missiles armed with nuclear warheads. As reminders, there were periodic checks of the air-raid sirens and the Conelrad emergency broadcast system, and signs identifying designated fallout shelters were visible in public places. Our high school had a civil defense club. The *Parade* Sunday supplement had instructions for making an electroscope radiation meter. Many American families built back-yard shelters, although even then they might have been considered “survival nuts,” as poignantly portrayed in a classic episode of *The Twilight Zone* entitled “The Shelter.” All states had an inventory of radiation survey instruments, which were periodically tested and calibrated. Seminars to train emergency managers in their use were held regularly. In October 1955, *California Medicine* devoted an entire issue to civil defense.

In the 1960s, a group of activist physicians called Physicians for Social Responsibility (PSR) undertook to “educate the medical profession and the world about the dangers of nuclear weapons,” beginning with a series of articles in the *New England Journal of Medicine*.<sup>1,2</sup> On its website, [www.psr.org](http://www.psr.org), the group boasts that it “led the campaign to end atmospheric nuclear testing.” With this campaign, the linear no-threshold (LNT) theory of radiation carcinogenesis became entrenched. It enabled activists to calculate enormous numbers of potential casualties by taking a tiny risk and multiplying it by the population of the earth. As an enduring consequence, the perceived risks of radiation are far out of proportion to actual risks,<sup>3</sup> causing tremendous damage to the American nuclear industry.<sup>4,5</sup>

Over the next decade, governmental civil defense programs declined, and public interest waned. By 1974, only 29 million public shelter spaces had been added to the 110 million catalogued by 1963 on order of President John F. Kennedy. The Medical Self-Help Program and the Medical Education for National Defense Program were terminated.<sup>6</sup>

I became involved in the early 1980s, when Australian pediatrician Helen Caldicott, M.D., gave a lecture at the University of Arizona College of Medicine. She handed out copies of the articles from the *New England Journal of Medicine*, displayed posters equating nuclear weapons with nuclear power production, and gave an impassioned appeal for physicians to join in the disarmament movement du jour, the Nuclear Freeze. PSR itself describes this campaign, which it called “the Bombing Runs,” thus:

When nuclear stockpiles hit an all-time high in the 1980s, a newly revitalized PSR, led by Helen Caldicott, MD, organized medical symposia in more than 30 cities throughout the country. Each event outlined for an overflow crowd how the cataclysmic effects of a nuclear attack on the US would leave the medical community helplessly short of personnel, medical supplies, and hospital beds needed to treat victims and alleviate human suffering.<sup>7</sup>

PSR’s successful efforts in garnering physician members and support sparked the formation of another group, International Physicians for the Prevention of Nuclear War (IPPNW), which won the Nobel Peace Prize in 1985 for its disarmament advocacy.

Although PSR’s description of the immediate effects of a worst-case scenario—the air-burst of a 1-MT nuclear weapon over a city—was accurate, it completely misrepresented the aftermath and the effectiveness of protective measures. Nuclear war, it declared, meant the utter destruction of the planet; if the explosive force of the weapons weren’t enough, there was always an ensuing climate catastrophe. During the 1980s, that was nuclear winter, although current visitors to the PSR website will find only allusions to global warming, not the slides about the Cold and the Dark that its members formerly showed to frighten schoolchildren.<sup>8</sup> Using a medical metaphor,<sup>9</sup> PSR claimed that treatment was impossible, and only prevention was acceptable. Efforts to save lives were not only futile, but unethical: Any suggestion that nuclear war could be survivable increased its likelihood and was thus tantamount to warmongering, PSR spokesmen warned.

When Ronald Reagan was elected President in 1980, he made an effort to revive civil defense with the appointment of General Julius

Becton to head the Federal Emergency Management Agency (FEMA). Becton stated that FEMA would start fulfilling its stated mission of preparing for “all hazards,” not “all hazards but one [nuclear war].” I was among the speakers invited to seminars held at the National Emergency Training Center (NETC) in Emmitsburg, Md., to counter the PSR message, and courses included shelter management, radiation monitoring, and other potentially lifesaving material. FEMA even funded the construction of five mobile shelter displays to teach the public about the most cost-effective form of all-hazards (NBC or nuclear, biological, chemical) shelter developed by American scientists and engineers—a buried steel cylinder that used earth-arching for blast protection.

Faced with governmental inertia as well as continued strong opposition from prestigious American physicians, Becton was unable to prevail over the anti-civil-defense forces. The first President Bush showed no interest in civil defense, and President Clinton eliminated the Office of Civil Defense from FEMA altogether. The states’ inventories of radiation meters were surplus; FEMA stopped distributing copies of *Nuclear War Survival Skills*, the civil defense bible discussed below; the shelter display with the FEMA seal was literally buried, and the ones with state seals were given to the states. Pennsylvania, under Governor Tom Ridge, later the first head of the Department of Homeland Security, sold its display at auction for less than the cost of repairing the trailer. The Arizona display was given to the small nonprofit organization that had loaned the funds for its construction (see [www.physiciansforcivildefense.org](http://www.physiciansforcivildefense.org)). The displays had never actually been used except when volunteers from citizen groups such as Civil Defense Volunteers of Utah or Doctors for Disaster Preparedness took them to county fairs.<sup>10</sup>

PSR takes credit for getting states to refuse to cooperate with FEMA’s evacuation plans.<sup>7</sup> While the reliance on evacuation certainly deserves criticism, PSR’s opposition to missile defense and especially to the construction of a survivable communications system is far less justifiable. Oddly, PSR does not trumpet its role in helping to destroy the nation’s rudimentary shelter system. A search of its website in April 2006 on “fallout shelter” turned up no matching items.

PSR started attacking the concept of shelter in 1962, and in public presentations frequently reiterated its assertion that shelters would simply be “crematoria,” as was allegedly proved in the World War II firebombing of Hamburg and Dresden. The original source was evidently the one referred to by Ervin et al. in 1962:<sup>1</sup> a book entitled *The Night Hamburg Died* by Martin Caidin, author of science fiction novels and books on military history.

This allegation remained unchallenged in the medical literature until 1990. Lucas et al.<sup>11</sup> reviewed the original source material, including the U.S. Strategic Bombing Survey, materials from the British Home Office, and the authoritative report by Hans Kehrl, Police President of Hamburg, who was responsible for firefighting and civil defense functions at the time of the attack. While Caidin

asserted that “not a single living soul survived” in shelters, Kehrl reported that casualties in shelters were principally in apartment building shelters, and that “in no instance either in bunkers or surface shelters did shelterees come to harm from the heat, nor did they have to leave the shelters prematurely.” The Caidin book was called “*den infamen Schwindelbericht*” (the infamous fraud) by Hans Brunswig, an eyewitness to the firestorm who later reviewed and updated Kehrl’s report.<sup>12</sup>

The *New England Journal of Medicine* rejected the Lucas article, which was submitted in 1988, after a lengthy delay, allowing its initial erroneous and unfounded assertion of the uselessness of shelter to stand, despite profound implications for public policy. *JAMA*, after demanding extensive additional documentation, ultimately rejected the article after a second round of peer review, and as of 1998<sup>13</sup> was still citing Ervin et al.<sup>1</sup> as authoritative. The Lucas article was published by the Southern Medical Association in 1990.

Official AMA policy H-520.997, Physician and Public Education on the Consequences of Thermonuclear Warfare, states that the AMA supports “informing the President and Congress of the medical consequences of nuclear war, so that policy decisions can be made with adequate factual information.” It also holds that it is “not appropriate” for the AMA to become involved in the “politics of nuclear war preparedness” (reaffirmed, Sunset Report, I-01).

Nevertheless, the 1998 *JAMA* article by Forrow and Sidel<sup>13</sup> notes with approval the shift from the physician support of civil defense in 1950 to the “strong and decisive” opposition of U.S. physicians to “preparations for nuclear war” in the 1980s. It states that “engendering fear of nuclear war is not enough.” Doctors are to demand the obliteration of all nuclear weapons on earth. Implicitly, assuring the maximum number of American casualties remains part of the strategy, even though, with the end of the Cold War, the “Mutual Assured Destruction” scenario of an overwhelming first strike by intercontinental ballistic missiles on hundreds of targets is seen as highly improbable.

## Current State of Civil Defense

Millions of U.S. taxpayer dollars were spent researching ways to protect against nuclear weapons effects. The technology has long been deployed—elsewhere in the world, as in Russia, Switzerland, China, and Singapore. During the first Gulf War, when coworkers and I were displaying the Pennsylvania shelter at the Great Allentown Fair,<sup>14</sup> we were told that the air filtration system, which was the type found in Swiss home shelters, was temporarily unavailable—because the units were so much in demand by Iraq. It was rumored that steel cylinders like our display were going to be buried in the desert to protect Iraqi troops against weapons of mass destruction. Iraq had used chemical weapons against Iranians during the Iran-Iraq War; we displayed photographs of some of the grisly results.

There are remnants of the civil defense test results on display at the Nevada Test Site. The classic report on nuclear weapons effects,<sup>1 5</sup> with the circular slide rule for estimating quantities such as overpressure at a certain distance from the blast, has long been out of print. Oak Ridge National Laboratory, which directed the civil defense research, was no longer able to maintain its library of priceless documents related to test results. The late Conrad Chester attempted to preserve them by donating them to Texas A&M University (C. Chester, personal communication, c. 1995), but recent efforts to locate them have largely proved unsuccessful.

U.S. government websites, such as [www.ready.gov](http://www.ready.gov), contain virtually no useful information concerning protection from nuclear weapons effects. Evacuation is downplayed; the logistical problems of evacuating a large city are obvious, as recent experience with Hurricane Katrina showed. “Shelter in place”—the “duct tape and plastic” routine—seems intended solely for chemical or biological events. Various old government documents and instructional films have been preserved by interested citizens, and many are accessible on the internet. Much of the information, such as in the “Duck and Cover” animation,<sup>1 6</sup> could save many lives, but because of its 1950s style, as well as anti-civil-defense ridicule, may not be viewed as credible.

Although a few fallout shelter markings may remain, supplies were discarded many years ago.

Shelters are for key government officials, as part of the Continuity of Government (COG) plan. The plan for civilian officials was seldom exercised and allowed to atrophy after the end of the Cold War, until it was activated at the time of the attacks on Sept 11, 2001. A “shadow government” of some 100 officials was secretly dispatched to the bunkers, where they reportedly discovered that significant upgrades are needed for computers that were “several generations” behind.<sup>1 7</sup>

As detailed in the spring 2006 issue of *AzMedicine*, published by the Arizona Medical Association, the readiness of physicians to participate in any type of civilian disaster has deteriorated over the past several decades. In 1980, the Pima County Medical Society staged the first city-wide disaster drill in Tucson; in 2003, few physicians even knew that a drill was underway at the airport.<sup>1 8</sup> Efforts to strengthen disaster response “from the bottom up” are being undertaken by the National Council on Readiness and Preparedness ([www.NCORP.org](http://www.NCORP.org)).<sup>1 9</sup> Volunteer health personnel are being organized in localities throughout the United States.<sup>2 0</sup>

Clearly, the federal government recognizes the existence of a nuclear threat. However, its efforts have focused on interdiction rather than attack survival. Thus, the instruments being deployed are extremely sensitive and would be overloaded and useless in a post-detonation environment.<sup>2 1</sup> The Department of Homeland Security has recently issued a document that at least recognizes that current guidelines for permissible radiation exposure are unnecessarily stringent, and would make it impossible to recover from a “dirty bomb” or nuclear attack.<sup>2 2</sup>

## The Present-Day Threat

As nuclear weapons proliferate, attempts to reawaken public fears are appearing. A DVD entitled *Last Best Chance*, which concerns theft of an old Soviet warhead, is available free of charge from a group called the Nuclear Threat Initiative, chaired by Ted Turner and former U.S. Senator Sam Nunn (see [www.nti.org](http://www.nti.org)). It was shown on HBO and discussed on NBC’s *Meet the Press* and ABC’s *Nightline*. Material similar to PSR’s “Bombing Runs” is making a comeback. A scenario describing a nuclear attack on New York City was discussed on *Hannity and Colmes* on the Fox News Channel; it can be downloaded from [www.atomicarchive.com](http://www.atomicarchive.com). Another scenario is a 15-KT terrorist bomb exploding in front of the National Archives in Washington, D.C., causing 15,000 immediate deaths and threatening 200,000 people with lethal fallout.<sup>2 3</sup>

## The U.S. Government “Plan”

Announcements that communities must plan to be “on their own” for 72 hours after a disaster, and public service announcements encouraging people to stockpile supplies “in case of an outbreak of bird flu” are possibly a tacit recognition that the federal government does not have the capability to provide meaningful aid in the immediate aftermath of a nuclear detonation. Federal officials are unlikely to inform the public of just how impotent they would be to help. Even the proposed “flexible” radiation exposure standards could preclude entry by outside rescue workers.

Scientists and engineers working in government-funded civil defense research programs recognized early that because of political considerations, the United States was not going to deploy a national civil defense system. Indeed, some of these men actually opposed civil defense advocacy as a waste of time. Instead, they devoted themselves to expedient (self-help) methods that individuals could use to save lives in the absence of government help. The essential facts about nuclear weapons effects and instructions for survival methods and equipment were compiled in the classic book originally published by Oak Ridge National Laboratory in 1979, *Nuclear War Survival Skills (NWSS)* by Cresson Kearny.<sup>2 4</sup> Included are plans for building expedient blast and fallout shelters, ventilation pumps, radiation meters, and water purification equipment, as well as advice on low-cost food storage, sanitation, and protective clothing. Instructions were field-tested to assure that ordinary Americans could use them without assistance to construct the items to specification. The shelters were tested in explosions. Although the government stopped publishing the book, it has been kept in print by private organizations and can be downloaded from the internet ([www.oism.org/nwss](http://www.oism.org/nwss)). It is important to recognize, however, that precise measurements are needed in making an accurate Kearny Fallout Meter (KFM), and the scales may be distorted in copying or downloading.

**Table 1.** Gamma Shielding by Various Materials<sup>15</sup>

Material	Density (lb/cu ft)	Tenth-value thickness (in)
steel	490	3.3
concrete	146	11
earth	100	16
water	62.4	24
wood	40	38

**Table 2.** Clinical Effects of Acute Doses of Ionizing Radiation<sup>15</sup>

Dose Range	Effects
0-100 rems	Subclinical; may have mild to moderate leukopenia above 50 rems
100-200 rems	Vomiting infrequent at 100 rems, common at 200 rems Moderate leukopenia Prognosis excellent
200-600 rems	Vomiting universal at $\geq 300$ rems Severe leukopenia, hemorrhage, infection Epilation above 300 rems Prognosis guarded
600-1,000 rems	Consider bone marrow transplantation Mortality 90 to 100% in 1 to 6 weeks
1,000-5,000 rems	Symptoms begin within 5 to 30 minutes Death from circulatory collapse in 2 to 14 days
> 5,000 rems	Symptoms begin almost immediately CNS affected: convulsions, ataxia, lethargy Death in less than 2 days

NWSS is—by default—the government plan for survival of American civilians. It provides the *only* radiation meter that could be produced in sufficiently large quantities on very short notice. Remarkably, a carefully made KFM is just as accurate as an electronic meter that costs \$1,000 or more. One professor of nuclear engineering said he'd prefer a KFM to an electronic meter if his life depended on it because a KFM is incapable of giving a falsely low reading (S. Jones, personal communication, 2006).

### The Role of Physicians

Physicians could help save millions of lives by serving as a credible source of crucial lifesaving information. Simply preventing panic would probably save more lives than almost anything else.

The first, most important fact is that those who are not within the zone of complete destruction by blast effects, who survive the detonation of the bomb, are quite likely to survive long term.

Chances of surviving the blast at some distance from the fireball are much enhanced by “duck and cover.” Soldiers are taught to lie down immediately if they see a flash or hear an explosion. It takes eight times as much force to move someone who is lying down as opposed to standing up. The flash travels with the speed of light; the speed of the blast wave is a function of the speed of sound. Many would be killed by being thrown against hard objects or struck with flying debris. Cover could protect against flying glass shards; any type of cover, even a newspaper, would provide some protection from the thermal pulse, which can last several seconds (S. Jones, personal communication, 2006).

Radioactive fallout would cause delayed casualties many miles away. But effective action can be taken.

People need to understand that radiation is not forever. It has a half life, in contrast to microorganisms, which have a doubling time. The isotopes generated in a nuclear explosion decay very rapidly. The exponential decay curve is such that within 7 hours, the radiation level is one-tenth the original level, and within 49 ( $7^2$ ) hours, the level is about one-hundredth ( $(1/10)^2$ ) of the original level. Dangerous fallout should be visible to the naked eye, as it consists of larger particles that have come to earth quickly while still very “hot.”

No special materials are needed for shielding. People simply need to put sufficient distance or mass between themselves and the

source. Water or wood or paper or buckets of rice can serve as shielding, but a greater thickness is needed, compared to denser substances such as concrete, earth, or lead (see Table 1). One half-value thickness of concrete is 2.4 in; of compacted earth, 3.6 in. Five half-value thicknesses reduces the radiation dose by a factor of  $2^5$ , or to 1/32 of the incident dose. Two tenth-value thicknesses reduce the dose to 1/100 of the incident dose.

High-dose radiation (a whole-body dose greater than about 600 rads delivered acutely) is unquestionably lethal. Radiation sickness causes a miserable death and is likely to be untreatable, even if medical facilities are available. But those who can keep their acute exposure below 100 rads will probably experience no symptoms of any kind (see Table 2). Those with acute exposures of around 30 rads or more might face a somewhat higher risk of cancer, delayed by some 20 to 30 years. They will not “glow in the dark” or give birth to two-headed children. Chronic exposure, however, within a certain dose range is likely to *lower* the risk of cancer and birth defects.<sup>25</sup>

Obviously it is highly desirable to be able to measure the dose. Nothing is easier to measure than radiation. The KFM, basically an electroscopes, is made from an aluminum can, aluminum foil, and nonconducting threads. It also requires a transparent plastic lid, some dessicant (such as fragments of gypsum wallboard), a charging device (plastic and paper), a millimeter scale, a bit of wire or a metal pin, a clock to measure time, and a copy of the appropriate calibration table.

Even a small investment in preparedness could pay big dividends in saving lives that otherwise would be lost. A minimal investment would include the items in Table 3.

Physicians who want to do more would acquire appropriate radiation monitoring instruments such as refurbished surplus civil defense survey meters and a Geiger counter, or a NukAlert, which can be carried on a keychain and alarms over a dose-rate range of 0.1 rad/hr to > 50 rads/hr. (Note that the advertised 10-year battery life of the NukAlert is greatly shortened if kept at high temperatures, as in an uncooled Arizona garage.) A Geiger counter

**Table 3.** A Basic Preparedness Kit for Nuclear Terrorism

- A printed copy of *NWSS*
- A ready-to-use KFM (buy one on the internet if you don't have time to make one or don't have a schoolchild to do it for you)
- An inventory of relatively hard-to-find items for making more KFMs, especially silica gel or other desiccant (the ionization chamber must be kept dry) and suitable nonconducting thread such as Trilene fishing line<sup>2 6</sup>
- A battery powered short-wave radio kept in a Faraday cage (wrapped in insulating material inside a metal box), plus plenty of batteries
- Knowledge about preparing expedient shelter (spend 8 minutes watching a video on Cresson Kearny's "core shelter" concept)<sup>2 7</sup>
- A printed copy of "What to Do If a Nuclear Attack Is Imminent" (download it *now*; don't count on internet availability)<sup>2 8</sup>
- Potassium iodide tablets (or KI crystals and brown dropper bottles for preparing a saturated solution) to block the thyroid and prevent absorption of radioactive iodine

is primarily useful when carrying out decontamination. It is highly sensitive, as anyone can demonstrate by placing the probe in a container of salt substitute (which contains KCl).

Physicians and other prudent citizens may also want to provide their loved ones with a comfortable, well-stocked permanent shelter.

## Conclusions

The de facto American plan for civil defense against nuclear threats appears to consist solely of do-it-yourself instructions, based on research that was done decades ago although still valid.

For the mindset that engendered and enables this situation, which jeopardizes the existence of the United States as a nation as well as the lives of millions of its citizens, some American physicians and certain prestigious medical organizations bear a heavy responsibility.

Ethical physicians should stand ready to help patients to the best of their ability, and not advocate sacrificing them in the name of a political agenda. Even very basic knowledge, especially combined with simple, inexpensive advance preparations, could save countless lives.

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