



Are You Ready?

I was watching the evening news on one of the major networks. As usual, there was a piece on the war in Iraq. This piece dealt with the role of military physicians and the success they are having in saving injured soldiers. I watched once again in awe of what our brother and sister physicians are capable of doing with massive trauma and admired their dedication.

I must admit I have long admired military physicians. In my view they practice a brand of medicine we see infrequently. There are no massive financial rewards for their efforts. They are patient-directed and, when necessary, even place themselves at risk to render care. I have never met a military physician who wanted anything other than the best possible care for patients with the means at his or her disposal. Likewise, I have learned that technologists with military backgrounds bring beneficial skills and assets to the civilian clinical setting. They are goal- and patient-directed, able to make decisions, mature, and reliable as a group. A lot can be learned from our military colleagues.

We are engaged today in a war inside and outside of Iraq that in the view of many will go on for a long time and will not be played by conventional warfare rules. Whether or not you support the war in Iraq, the existence of worldwide terrorist efforts cannot be denied. Terrorists of various persuasions have become increasingly more sophisticated over the last 20 years. Massive bombings and sabotage have become common, and the best efforts of many governments have not been able to thwart these acts. As their sophistication increases, it becomes more and more likely that radiological weapons will become a part of the terrorist armamentarium.

We tend to think of radiological weapons in terms of those posed atop ICBMs. Those weapons still exist but are not the likely choice of terrorists. They are too difficult to obtain, contain many safeguards, and require some degree of expertise to operate. The world today, however, is replete with other radioactive sources that can be built into a radiological weapon. A Google search of "radiological weapons" yielded 1,420,000 hits, the vast majority of which did not deal with military weapons.

If we accept the premise that the object of a terrorist is to create chaos and fear, then nothing is more attractive to such an individual than a weapon that disperses radioactive material. The innate fear of radiation among the general public is such that even with minimal destruction, the results of a radiological event could include significant economic impact, disruption of commerce, and adverse effects on daily life. Many in the field believe that it is a question of "when" and not "if" such weapons will be employed.

The techniques used by our colleagues to treat the military in Iraq today were not developed overnight. They knew the risks they would face in the future and made preparations to deal with those risks, even with the uncertainty of when they might be called on to bring these techniques to bear. We now face the same situation. Are you prepared as an expert in radiation medicine to deal with an event in your community? Do you know how to assess patients for contamination? Have you ever practiced decontamination of patients in an emergency room setting? Do you know what blood tests to order and how to assess the dose received by a patient from the results of the test? Do you have a working arrangement with other specialists to safely support exposed patients? Have you trained with first responders to coordinate the assessment of a radiation incident and prevent further contamination? For most of us, the answer to these questions is a uniform "no".

As with any other emergency event, we must plan and train if we are to respond successfully. Some of us have been fortunate enough to have worked over the years at first-response institutions for industrial users of radioactive materials. We know how complex the planning process is and how much preparation and training are required. More than 30 years ago, before Three Mile Island and Chernobyl, our institution had a plan in place for responding to a radiation accident. As part of their training, our nuclear medicine residents were encouraged to attend the REACT/TS (Radiation Emergency Assistance Center: Training Site) physician course in Oak Ridge, TN. Today, our residents are asked to participate in the drills we have in the hospital. Radiation accident training is part of our residency curriculum for both radiology and nuclear medicine residents.

After September 11, 2001, when it became evident we were at the beginning rather than the end of a period of terrorism, our plans were revised to handle a terrorist incident. Working with local first responders, grant money was obtained to purchase a mobile decontamination facility to augment that in our emergency department and to purchase all other necessary equipment to fulfill our part of the mission. Our local first responders have enthusiastically participated in training and coordination.



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sham surgery or acute ischemia/reperfusion injury. Animals in the sham ($n = 16$) and ischemia/reperfusion ($n = 22$) groups were injected with 5×10^6 of the L2G85-derived BMMCs. Bioluminescence imaging was used to track cell migration and survival for 4 weeks and showed preferential BMMC homing to

hearts in the ischemia/reperfusion injury group within the first week after cell injection. Ex vivo analyses later confirmed the imaging results. Functional evaluation by echocardiography indicated a trend toward improved left ventricular fractional shortening in animals receiving BMMCs. The au-

thors concluded that “these data demonstrate that molecular imaging can be used to successfully track BMMC therapy in murine models of heart disease” and that “systemically delivered BMMCs preferentially home to and are retained by injured myocardium.”

Stem Cells

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What can an individual physician do? First, devote a portion of your CME time to developing expertise in dealing with a radiological event. Encourage your institutional planners who deal with disaster plans to involve you in their discussions. Reach out to your first responder community and develop links with them so that you know their capabilities and they know yours. Talking and training together will improve all of your skills. Assume that for at least a while your local community will have to bear the burden of responding to an event should one occur. Our mil-

itary counterparts developed their techniques during a period of relative peace; we must do the same.

Like our military colleagues, we may believe that we are developing a plan for something that will never happen. The success of military medicine today, however, is rooted in planning for possible events. We cannot risk being unprepared, because one day, quite suddenly, we could find ourselves on the front line.

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