

The Roles of Acupuncture and Other Components of Integrative Medicine in Cataclysmic Natural Disasters and Military Conflicts

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ABSTRACT

Background: In the recent past, numerous natural disasters and wars have resulted in casualties on site that have been treated successfully by trained personnel using holistic medical techniques, including acupuncture, hypnosis, yoga, biofeedback and other techniques. Adaptations of several of these medical modalities may be taught to first responders.

Objective: This article provides a compilation of advice and techniques by practitioners of integrative medicine designed to aid first responders of cataclysmic natural disasters or military conflicts. Coverage includes simple, specific, integrative medicine modalities that have accessible techniques for most community-based responders.

Method: This overview describes techniques that have been found to be useful during natural disasters and armed conflicts, such as the Fukushima Daiichi earthquake and the battlefields of Iraq and Afghanistan. The more trained personnel who are able to respond in a crisis, the better the outcome will be for the wounded population.

Conclusions: Integrative medicine and traditional medicine techniques can be useful in times of natural cataclysmic disasters and military conflicts.

Key Words: Natural Disasters, Military Conflicts, Alternative Medicine, Acupuncture, Yoga, Hypnosis, Battlefield Acupuncture, Hormesis, National Disaster Medical System, Building Community Resilience

INTRODUCTION

THE PURPOSE OF THIS ARTICLE is to explore the role that integrative medicine may play in a disaster and post-disaster environment, as well as in military conflicts. Integrative medicine will not take the place of classical Western medicine and life-saving surgery for resuscitation and stabilization; however, integrative medicine may mitigate significantly the psychologic and physical effects of stress and pain associated with natural disasters and military

conflicts. For this reason, a discussion of the role of integrative medicine in these environments is warranted—especially some of the specific techniques and evidence that supports the use of integrative medicine.

The rescue, treatment, and evacuation of thousands of patients from a cataclysmic natural disaster or military conflict must be coordinated with a lead agency that is recognized and responsible for such an intervention. It cannot be an *ad hoc* effort; rather it must be one that has been practiced repeatedly. Medical care must meet—at a

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minimum—the local health and international standards for disaster care.¹

Mass casualty disasters place a severe strain not only on the victims but also on the people and resource personnel who have the extremely difficult task to rescue and care for hundreds to thousands of those victims. Their care often requires the enormous efforts of both local and international assistance. Any delays in the rescue of individuals or the provision of community resources and care will increase morbidity and mortality rates.¹

Addressing the complex requirements involving the integration of many different communication systems and the difficulty of exchanging information among rescue agencies becomes a formidable technical challenge. This may be compounded by telecommunication-systems overload or failure and electrical-service disruption in the disaster areas.¹

In addition, emergencies are characterized by a sudden need for an increase of information flow, an explosion in the topographical complexity of the information network, and a feeling of intense psychologic pressure among the participants involved in the early hours of the rescue. Unfortunately, many people and organizations who should be talking to each other do not do so until communication is urgently required because of an external emergency. Group members often find themselves confronted with unfamiliar procedures and with unknown partners in the crisis-management process. As a result, decisions may be made under conditions of low group trust and inadequate sharing of information.¹

Established communication systems in most American communities consist of private services, state and federal agencies, and military and amateur radio operators. A disaster situation can disrupt routine hospital communication severely. Customary frequencies may be incompatible with military and emergency civilian frequencies or become overloaded and useless because of intense communication activity. In a cataclysmic disaster, local communication networks may be inadequate or unavailable to cope with the demands of the emergency. Disasters can stress health care systems to the breaking point and disrupt delivery of vital medical services.¹ To the extent that care and relief can be allocated locally and rely less on these complicated systems, the less those relief components risk being slowed or entangled in those systems and the more timely and effectively care can be provided to the victims and affected communities.

PREPARING FOR THE UNEXPECTED

Any area in the world that is prone to natural disasters should prepare for such an event. Even with regular disaster preparedness training and rehearsals, disaster medical workers may be hampered by the stress and fatigue caused by the actual disaster when it occurs, both of which may limit these rescuers' effectiveness as emergency providers. While a full discussion of critical logistic challenges, sup-

plies, and specialized rescuers just for the initial first aid and rescue of the victims is beyond the scope of this article, it describes some approaches for allocating relief support to local communities as a possibility, using simple, integrative health care approaches that do not require extensive equipment, facilities, or supplies.

A SYSTEMS FRAMEWORK FOR RESPONSES TO CATASTROPHIC DISASTERS

The National Disaster Medical System

The National Disaster Medical System (NDMS) is a section of the United States Department of Health and Human Services, which is responsible for managing the federal government's medical response to major emergencies and disasters. The overall purpose of the NDMS is to supplement an integrated national medical response capability for assisting state and local authorities in dealing with the medical impacts of major peacetime disasters, and to provide support to the military and the Department of Veterans Affairs medical systems in caring for patients evacuated back to the U.S. from overseas armed conventional conflicts. The NDMS's federal partners include the Federal Emergency Management Agency, Department of Defense, and the Department of Veterans Affairs. The NDMS also interfaces with state and local Departments of Health, as well as with private hospitals.

Organization

NDMS has three major components:

- (1) Emergency medical response by civilian medical teams, equipment, and supplies to a disaster area when local medical resources are overwhelmed
- (2) Movement of ill and injured patients from a disaster area to unaffected areas
- (3) Definitive care of patients in hospitals in areas unaffected by the disaster.

More than 8000 NDMS civilian volunteer medical individuals are organized into a number of types of medical teams, designed to accomplish an emergency medical response mission.

NDMS Teams

The NDMS is composed of several smaller teams, each of which focuses on a particular area of disaster relief. These include:

- *Disaster Medical Assistance Team (DMAT)*—provides medical care during a disaster or other incident
- *National Medical Response Team*—provides mass decontamination and medical care to victims of a release of weapons of mass destruction or a large-scale release of hazardous materials

- *Disaster Mortuary Operational Response Team*—provides victim identification and mortuary services during a disaster or other incident
- *National Veterinary Response Team*—provides assistance in assessing the need for veterinary services following major disasters or emergencies
- *Federal Coordinating Centers*—recruit hospitals and maintain local nonfederal hospital participation in the NDMS and coordinate exercise development and emergency plans
- *National Pharmacy Response Team*—assists with chemoprophylaxis or vaccination of large numbers of citizens in response to an emergency involving a disease outbreak
- *International Medical Surgical Response Team*—widely recognized as a specialized team, is trained and equipped to establish a fully capable field surgical facility anywhere in the world
- *National Nurse Response Team*—a specialty DMAT designed for a scenario requiring hundreds of nurses to assist in chemoprophylaxis, mass vaccination programs, or situations that overwhelm the nation's supply of nurses.

More than 1800 civilian hospitals in the United States are members of the NDMS. Their role is to provide ~ 100,000 treatment beds to support NDMS operations in emergencies. When a civilian or military crisis requires the activation of the NDMS system, participating hospitals communicate information about their available bed space to a central control point. Patients can be distributed to a number of hospitals without overwhelming any one facility with casualties.²

The Red Cross provides significant aid to disaster victims from their volunteers and private donations. Their humanitarian efforts are unmatched worldwide not only during the rescue events but also in their post-rescue efforts to help stabilize wounded and demoralized victims by providing shelter and medicine. This organization serves as an important bridge for locating separated families and loved ones. The Red Cross is always present in the worst cataclysmic situations, bringing comfort and hope to victims.

RECENT INTERNATIONAL AND NATIONAL NATURAL CATAclySMIC DISASTERS.

The 2011 Tōhoku Earthquake and Tsunami

The 2011 earthquake off the Pacific coast of Tōhoku (Tōhoku-chihō Taiheiyō Oki Jishin), often referred to in Japan as *Higashi nihon daishin-sai*—also known as the 2011 Tohoku earthquake, the Great East Japan Earthquake, and the 3.11 Earthquake—was a magnitude 9.0 (M_w) undersea megathrust earthquake off the coast of Japan.³ The earthquake occurred at 14:46 JST (05:46 UTC) on Friday,

March 11, 2011, with the epicenter ~ 70 kilometers (43 miles) east of the Oshika Peninsula of Tōhoku and the hypocenter at an underwater depth of ~ 32 km (20 miles). It was the most powerful known earthquake ever to hit Japan and one of the five most powerful earthquakes in the world since modern recordkeeping began in 1900. The earthquake triggered powerful tsunami waves that reached heights of up to 40.5 meters (133 feet) in Miyako in Tōhoku's [Iwate] Prefecture and which, in the Sendai area, traveled up to 10 km (6 miles) inland. The earthquake moved Honshu (the main island of Japan) 2.4 m (8 feet) east and shifted the Earth on its axis by estimates of between 10 cm (4 inches) and 25 cm (10 inches).

On September 12, 2011, a Japanese National Police Agency report confirmed 15,870 deaths, 6,114 injured, and 2,814 people missing across twenty prefectures. In addition, 129,225 buildings totally collapsed, 254,204 buildings “half collapsed,” and another 691,766 buildings were partially damaged. The earthquake and tsunami also caused extensive and severe structural damage in northeastern Japan, including heavy damage to roads and railways as well as fires in many areas, and a dam collapse. Japanese Prime Minister Naoto Kan said: “In the 65 years after the end of World War II, this is the toughest and the most difficult crisis for Japan.”³ Approximately 4.4 million households in northeastern Japan were left without electricity and 1.5 million were without water.

The tsunami caused a number of nuclear accidents, primarily the level 7 meltdowns at three reactors in the Fukushima Daiichi Nuclear Power Plant complex, and the associated evacuation zones, affecting hundreds of thousands of residents. Many electrical generators were taken down, and at least three nuclear reactors exploded as a result of hydrogen gas that had built up within their outer containment buildings after cooling-system failure. Residents within a 20-km (12 mile) radius of the Fukushima Daiichi Nuclear Power Plant and a 10-km (6.2 mile) radius of the Fukushima Daini Nuclear Power Plant were evacuated. In addition, the United States recommended that its citizens evacuate areas within up to 80 km (50 miles) of both plants.

Early estimates placed insured losses from the earthquake alone at US \$14.5–\$34.6 billion. The Bank of Japan offered ¥15 trillion (US \$183 billion) to the banking system on March 14, 2013, in an effort to normalize market conditions. The World Bank's estimated economic cost was US \$235 billion, making this earthquake the most expensive natural disaster in world history.³

The 2010 Haiti Earthquake

This catastrophic event was a magnitude 7.0 M_w earthquake, with an epicenter near the town of Léogâne, ~ 25 km (16 miles) west of Port-au-Prince, Haiti's capital.⁴

By January 24, 2010, at least 52 aftershocks, measuring $\geq 4.5 M_w$ had been recorded. An estimated 3 million people

(roughly 30% of the entire population) were affected by the quake; the Haitian government reported that an estimated 316,000 people had died, 300,000 had been injured, and 1,000,000 had been made homeless. The government of Haiti also estimated that 250,000 residences and 30,000 commercial buildings had collapsed or were severely damaged.

The earthquake caused major damage in Port-au-Prince, Jacmel, and other settlements in the region. Many notable landmark buildings were significantly damaged or destroyed, including the Presidential Palace, the National Assembly building, the Port-au-Prince Cathedral, and the main jail. Among the people killed were the Archbishop of Port-au-Prince, Joseph Serge Miot, and political [opposition] leader Micha Gaillard. The headquarters of the United Nations Stabilization Mission in Haiti, located in the capital, collapsed, killing many people, including the Mission's chief, Hédi Annabi.

Many countries responded to appeals for humanitarian aid, pledging funds; and dispatching rescue and medical teams, engineers, and support personnel. Communication systems; air, land, and sea transport facilities; hospitals; and electrical networks had been damaged by the earthquake, which hampered rescue and aid efforts. Confusion concerning who was in charge, air-traffic congestion, and problems with prioritization of flights complicated early relief work further. Port-au-Prince's morgues were overwhelmed with tens of thousands of bodies. These had to be buried in mass graves. As rescue efforts diminished, supplies, medical care, and sanitation became priorities. Delays in aid distribution led to angry appeals from aid workers and survivors, and looting and sporadic violence were observed. On January 22, 2010, the United Nations noted that the emergency phase of the relief operation was drawing to a close, and, on the following day, the Haitian government officially called off the search for survivors.⁴

Hurricane Sandy and the Moore, Oklahoma, Tornado

Two natural cataclysmic events in the United States were Hurricane Sandy, in several states, in late October 2012, and the more-recent tornado that struck Moore, OK, on May 20, 2013. Both of these natural disasters resulted in horrendous destruction and loss of life.⁵

Hurricane Sandy was responsible for 117 deaths in the United States (in New York State, New Jersey, Pennsylvania, West Virginia, Maryland, and elsewhere). In addition, 7.9 million businesses and households were without electricity and 9000 people in 13 states spent the night in 171 Red Cross Shelters. The damage produced billions of dollars worth of damage. In New Jersey alone, estimates were >\$36.8 billion.⁶

The Moore, OK, Tornado killed 24 people, created a 17-mile wound in the landscape, and left a trail of destruction that was >1 mile wide in some places. This was the

most destructive tornado on the Fujita scale. The tornado pulverized buildings and homes; and photographs of the area look as if a nuclear bomb had flattened the town.⁷

EXAMPLES OF THE USE OF INTEGRATIVE MEDICINE DURING AND AFTER NATURAL CATAclySMIC DISASTERS AND MILITARY CONFLICTS

The 2011 Japan Earthquake

Shin Takayama reported that, following the Great Japan earthquake that inflicted immense damage over a wide area of eastern Japan with the consequent tsunami (March 11, 2011), massage therapy and acupuncture were administered to 553 people at evacuation centers with a 92.3% satisfaction rate.⁸

Currently research on acupuncture utilization after a natural disaster or military conflict is mostly anecdotal. However, a study examined the use of electroacupuncture (EA) for post-traumatic stress disorder (PTSD) following an earthquake (the 2008 Japan Wenchuan earthquake). A total of 138 participants were randomly assigned to either EA or medication therapy. The researchers concluded that EA had better efficacy than medication therapy.⁹

Hurricane Katrina

Henri Roca III, MD—an assistant professor of medicine at Louisiana State University (LSU), in New Orleans, and chief of LSU's Integrative Medicine program—reported that the holistic approach, “is really the *only* way to work with people surviving [a] disaster.”¹⁰ Dr. Roca provided Katrina survivors with comprehensive holistic services, including acupuncture, guided imagery, biofeedback, massage, hypnotherapy, botanical medicine, and nutritional counseling.¹⁰

Acupuncturists Without Borders (AWB) organized hurricane relief efforts.¹¹ Hurricane Katrina and its aftermath have elicited an unprecedented response from acupuncturists and supporters throughout the country. AWB is an organization mobilized to provide care and services for individuals affected by the storm and related tragedy. Community responses of this type were first mounted after the September 11, 2001, terrorist attack in New York and other cities on the East Coast.¹¹ Using ear acupuncture and National Acupuncture Detoxification Association (NADA) approaches, treatment has been provided to thousands of individuals. The focus of treatment is on minimizing physical pain and psychologic distress related to disaster and/or tragedy.¹¹

In response to Hurricane Katrina, AWB was able to mobilize ~ 100 acupuncturists between 2005 and 2006 to treat victims who experienced psychologic stress caused by the hurricane.¹² During a 3-month span (October–December 2005) acupuncturists delivered 2500 treatments in the hardest hit areas. The treatments were free and intended to provide relief from pain and sleeplessness and help mitigate

stress during circumstances when medications and counseling were in short supply.

In addition, in 2006, AWB developed and launched the Military Stress Recovery Project (MSRP), which provides free acupuncture services to active-duty military, Veterans, and family members. The free treatments are offered weekly on a walk-in basis and were developed to help address the wounds and psychologic stress associated with current conflicts. As of 2010, AWB estimates that it has delivered more than 1000 treatments through the MSRP.¹²

Iraq and Afghanistan Military Conflicts

Sgt. Brandy Rose Lipscomb, a naturopathic student, ordered to active duty with her military reserve unit, found that she could bring many holistic techniques, including homeopathy, CranioSacral therapy, and guided imagery, to the (military) base. Some of the men (in this all-male group) she treated had been exposed to significant environmental toxins from trash dumps or the fires that inevitably follow heavy combat. “We were able to do detoxification protocols to help them clear the toxins,”¹⁰ she said. Sgt. Lipscomb found homeopathy to be an invaluable healing ally: “It really is an amazing modality. I treated soldiers with spider bites, chemical burns, mortar wounds. It is highly effective. I think homeopathy should be a basic part of American health care.”¹⁰

At Camp Leatherneck, which is a huge United States Marine Corps base in southern Afghanistan, physicians and other health care providers are using techniques, such as Battlefield Acupuncture (BFA) and Koffman’s Acupuncture Cocktail, to help heal soldiers, particularly those who have pain and concussions from explosives.¹² Although scientific studies may not have definitively proved acupuncture to be effective, Helm’s Acupuncture Trauma Protocol is also being tried to heal the wounded warriors who have PTSD. The Navy, Army and Air Force have trained more than 100 physicians in medical acupuncture in formal acupuncture courses. In April 2013, \$5.4 million was awarded to the Army, Navy, Air Force, and Veterans Administration (VA) to teach and evaluate BFA to health care providers in military and VA medical facilities. The Air Force has tried BFA to dampen the pain of wounded warriors who were being transported by air from Germany to Joint Base Andrews, MD.

ACUPUNCTURE FOR TREATING DISASTER VICTIMS

Battlefield Acupuncture (BFA)

Immediately after the Haiti earthquake, when there was a paucity of pain medications; rescuers were successful in controlling pain by using BFA.¹³ Typically, gold Aiguilles Semi-Permanentes (ASP) needles (Sedatelac, Chemin des Muriers France, Irigny) can be retained in ear acupoints for up to 3–4 days or longer before being pushed out to the

skin’s surface by the previous flattened epidermis. Gold ASP needles are sequentially placed in the ear at very specific points—Cingulate Gyrus: Thalamus Point; Omega 2; *Shen Men*, and Point Zero bilaterally. There is an advanced technique that requires the acupuncturist to find the “dominant ear” and to use dissimilar metal ASP needles in either a linear formation or a clustering effect. Nevertheless, the majority of patients experience immediate pain reduction within seconds to minutes without side-effects. The remission period varies, depending on the pathology, but may be minutes, hours, days, or weeks. In post-earthquake Haiti, faced with short supply or nonavailability of appropriate needles to insert in the ear, health care personnel used their fingernails on the auricular points associated with the BFA technique to attenuate pain.

Most patients report a calming and significant reduction of pain within minutes. The rapid reduction of pain reduces the emotional stress of enduring acute and chronic pain. In a preliminary functional magnetic resonance imaging (fMRI) clinical pilot study conducted by Niemtzwow (unpublished data) at the Neuroscience Research Institute (with Zhang-Hee Cho, PhD) in Incheon, Korea, normal subjects had pain produced in their left index fingers by immersion into hot water. A comparison of central nervous-system fMRI activity between subjects without and with needles in the BFA points was made. The study demonstrated that needles in the Cingulate Gyrus, Thalamus, Omega 2, *Shen Men*, and Point Zero points produced significant attenuation in the brain areas of the cingulate gyrus, thalamus, hypothalamus, and other areas. This attenuation correlated to a reduction of pain.

Although the results of another study were very preliminary, Litscher et al. demonstrated with infrared spectroscopy that oxygen levels in the brain may also be influenced by BFA.¹⁴ BFA may also have central nervous system, hyperbaric oxygen properties that may be useful in the healing of mild traumatic brain injuries.¹⁴

Because the needles are portable and the technique is rapid, efficient, taught easily, and almost without side-effects, the United States Armed Forces has taught this technique to hundreds of military physicians and special-operation forces. BFA has been used successfully in the Iraq and Afghanistan battlefield environment. It is also in widespread use in many parts of the world by health care providers. This technique may be used in land, sea, and air environments.

OTHER INTEGRATIVE MEDICINE APPROACHES FOR TREATING DISASTER VICTIMS

Yoga

Although more clinical studies are needed to document the benefits of programs that combine *prānāyāma* (yogic breathing) *āsanas* (yoga postures), and meditation, there is

sufficient evidence to consider *Sudarshan Kriya Yoga (SKY)* to be a beneficial, low-risk, low-cost adjunct for treating stress, anxiety, PTSD, depression, stress-related medical illnesses, and substance abuse, as well as for addressing rehabilitation of criminal offenders. SKY has been used as a public health intervention to alleviate PTSD in survivors of mass disasters. Yoga techniques enhance well-being, mood, attention, mental focus, and stress tolerance. Proper training by a skilled teacher and a 30-minute practice every day will maximize the benefits. Health care providers play a crucial role in encouraging patients to maintain their yoga practices.¹⁵

Hypnosis in Mass Casualty Situations

Medical hypnosis may help in a mass casualty situation.

The three vital components of a successful hypnotic experience are (1) motivation, (2) belief, and (3) expectation.¹⁶ In a trauma situation, motivation is usually not an issue, as people generally want to live, survive, and recover. The practitioner needs to foster belief and positive outcomes in patients by using techniques based on hypnotic phenomena. The effects listed below are normal human reactions that are intensified in the hypnotic situation. The effects that are most useful in a mass casualty situation would be:

- *Amnesia*—the ability to forget
- *Dissociation*—the ability to detach from the sensory environment around one to “go someplace else”
- *Hypnoanalgesia*—the ability to decrease pain sensations
- *Hypnoanesthesia*—the ability to remove pain sensations
- *Negative hallucination*—not seeing something that actually exists
- *Positive hallucination*—imagining something that does not really exist
- *Time distortion*—perceiving a different timeframe than that which actually exists
- *Posthypnotic distortion*—a suggestion offered during trance that affects perception or functioning at a later time.¹⁶

In medical hypnosis, there are two general strategies used to help create the above phenomena—psychodynamic and symptomatic¹⁶. For mass casualties in an acute situation, symptomatic technique—a technique used to just treat symptoms such as anxiety, pain, depression, fear, etc.—should be used.

Each individual hypnotic experience is comprised of the induction state, the trance stage, and the reversal stage. There is voluminous literature covering all three stages¹⁷. However, in a mass casualty situation, nonprofessional providers may be helping an experienced hypnotist, so the following concepts and strategies are important and appropriate for untrained practitioners to use:

Induction. Generally, a person who has a traumatic experience are in near trance and will very easily go into a hypnotic state. The provider can use varying words, tone, and inflections, depending on the situation to deepen the trancelike state into an actual trance.¹⁸ It is very important for the provider to mirror the patient. If the patient is agitated and screaming, the provider must have a louder, more-rapid rate of speech. If the patient is lying quietly and is motionless, the provider should speak in slow, soft tones. If the patient’s name is known, it should be the first words said by the provider, as hearing one’s name is very comforting and reassuring, and facilitates the therapeutic alliance greatly. Generally, one can tell that a trance is entered when the patient’s eyelids start fluttering.¹⁶

In a mass casualty situation, a patient may be so injured or distraught that following simple instructions, such as clenching a fist, may be impossible to follow. Thus, the best induction technique to use would be the first one listed above (i.e., mirror the patient).

Trance. The trance stage occurs after induction is complete. A patient can be in a trance and yet seemingly be “wide awake” with the eyes open and conversing. However, more typically, a patient will close the eyes and become motionless.¹⁶

During trance the patient is given hypnotic suggestion to effect change in a symptom or physiologic or psychologic state—and this is where the amygdala is “talked to.” There are literally hundreds of symptoms or physiologic states that will respond to hypnotic suggestion. This includes parameters such as respiratory rate, oxygenation, heart rate, blood pressure, hemostasis, burn injury, and pain.^{19–22}

In a mass casualty situation, there are many types of injuries with varying degrees of severity. As the providers may not be trained medical hypnotists, the best strategy would be a script that serves as a template that includes somewhat general suggestions.

The script should be short and simple so that the provider can recall it easily without notes. The best technique in this situation would be to provide a patient with more general, less-specific suggestions that a patient can then internalize and individualize to best suit his or her own emotional landscape. The overall theme of the suggestions is to foster the patient’s belief and expectation that he or she will survive the casualty event and thrive afterward.

Reversal. Generally, a patient who is helped to go into a trance should be given the opportunity by the provider to come out of the trance, but it is not unusual for patients to resist this. This is not deleterious and the provider should never force a patient to go into a reversal state. If the provider needs the patient to do something (i.e., run away from molten lava) and the patient is resisting reversal, then the command can be given as a hypnotic suggestion.

First responder implementation. One possible scenario for having the capability to provide medical hypnosis in a rapid, effective manner in a mass casualty situation would require some prior planning and training. Simple, short hypnosis scripts should be developed by medical hypnosis professionals. As medical hypnotherapy scripts are culturally and linguistically specific, every attempt should be made to have script authors who are familiar with the communities and populations in which the scripts would be deployed.²³

First responders are then given training and rehearsal in delivering the scripts, which, if simple enough, would be likely to only require 8 hours of training. Responders could practice on each other to experience both providing medical hypnosis and going into and out of trance. The capability to provide this care is then placed into the treatment algorithm as decided on by the public health authorities.

Children are incredibly easy to hypnotize. Hypnosis should be considered as a very early intervention in the treatment of an injured child.²⁴

Hypnosis is not effective in all patients and the reason for that is not well-known. It is likely that up to 10% of patients will not have much of a response even with experienced providers.²⁵

Current author Marcucci had a patient who was hemorrhaging in an emergency room. The entire hypnotic session with induction, hypnotic suggestion, posthypnotic suggestion, and reversal, was accomplished with five sentences. The bleeding in the surgical field largely stopped ~ 20 seconds after the instruction, and the patient survived the operation and was discharged later in satisfactory condition (personal communication with Lisa Marcucci, MD).

HORMESIS: RAPID INDUCTION OF PROTECTIVE TOLERANCE TO TREAT OR PROTECT AGAINST EXPOSURE TO TOXINS

Many victims of a catastrophic event may have been exposed to chemical and radioactive toxins.

After the attack of 9/11, toxins were released into the atmosphere by the destruction of the Twin Towers in New York City. Not only the general population at large was exposed, but the rescuers themselves were exposed to the toxins. Hormesis may be a possible consideration for future protection from such toxic exposures. The use of hormesis as a therapy or for protection would involve administering low, not toxic, doses of the primary agents to induce resistance or to accelerate cellular repair mechanisms. This process is called rapid induction of protective tolerance (RIPT).²⁶

There are a number of examples whereby exposure to subtoxic doses of otherwise toxic compounds confers protection and treatment against higher toxic doses of the same or similar harmful compounds.²⁷ RIPT occurs by inducing a

stimulatory effect on cell repair, tolerance, and protective processes. One challenge in the study of this area is that significant clinical effects could arise from a coordinated whole organism response of inherent (self-derived) healing and defense processes that are complex to investigate. Thus, it is difficult to determine the dose and frequency of administration needed for each toxin. The clinical value of hormesis may be most evident if multiple, redundant mechanisms are induced.^{28,29}

Many cellular protective mechanisms are distinct from immune stimulation, such as that produced by vaccines; yet immune mechanisms may enhance and extend a RIPT effect.³⁰ If this proves to be true, it would allow rapid use of hormesis in a wide variety of situations, including terrorism; environmental disasters; drug toxicity, cancer; and emerging infections, such as influenza, severe acquired respiratory syndrome, (SARS) and Avian flu.

Terrorism and biowarfare protection. There is evidence that RIPT against biowarfare and terrorists agents may be feasible.^{31,32} In an early double-blinded, placebo controlled, multicenter clinical study, use of the biowarfare agent mustard gas demonstrated that low-dose mustard gas and similar blistering agents reduced damage caused by mustard in humans.³³ Little research on the concept followed, however. Jonas et al. did a comprehensive, systematic review of the chemical, biologic, radiologic and nuclear (CBRN) literature for studies examining the stimulatory and protective effects of the top ten CBRN terrorist agents.³⁴ Although the area is rarely investigated, most studies that specifically looked for stimulatory or protective effects, found them, including with the potent neurotoxins soman and sarin. Jonas and Dillner³⁵ investigated if low-dose preparations of infected tissue given to mice could induce protection against a higher infectious challenge by the same organism (*F. tularensis*). These preparations consistently increased mean survival time and decreased mortality from tularemia infection, a top biowarfare threat agent.

Environmental toxins and cancer. The RIPT approach may also help mitigate the effects of environmental toxins, such as arsenic, mercury, and cadmium. Linde et al.³⁶ and Calabrese et al.³⁷ conducted meta-analyses of the literature on the protective effects of environmental toxins of various types. Significant protective effects were demonstrated in repeated studies with arsenic and mercury, two of the most important environmental toxins worldwide. Low-dose arsenic and mercury enhanced toxin excretion up to 40% and reduced mortality to lethal doses by 19%.³⁸ Similar work with cadmium was reported in studies.³⁹ As with CBRN and brain-injury agents, the rapid induction of protective proteins appears to be an important mechanism. Van Wijk demonstrated that specific patterns of heat shock proteins predicted cross protection to a variety of environmental toxins.⁴⁰

Gaddipati et al.³⁹ and Delbancut et al.⁴¹ have shown in their respective laboratories that nontoxic, low-dose cadmium exposure rapidly stimulates the specific methallothienien production (a protective protein) and its mRNA signal, and that this effect can be maintained for weeks with no adverse effects on cell growth, replication, function or mortality. Subsequent exposure of the same cells to higher doses of cadmium showed delayed transformation into cancer, usually produced by cadmium. Thus, an apparent “window of protection” to specific agents can be turned on and off for weeks at a time without harm.

CONCLUSIONS

The studies discussed in this article, and other studies and experiences, show that a number of integrative health care products and practices could provide valuable adjunctive approaches to the usual-care strategies used for natural disaster and combat zone relief. These approaches are usually inexpensive and nontoxic, are inherently low-risk, do not require complicated delivery methods, and can be pushed far forward in disaster relief effort even when other resources cannot be delivered. Such approaches may provide significant and rapid relief for victims of disasters and wars, as well as for their caregivers. These approaches should be investigated further and tested systematically in disaster and wartime environments. In addition, members of communities, such as Galveston TX, that experienced devastation after Hurricane Ike may find the use of various alternative medicine techniques helpful for building community resilience to future natural disasters.⁴²

DISCLOSURE STATEMENT

No competing financial conflicts exist.

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