

# Disaster Nursing

## New Frontiers for Critical Care

Erin Cox, RN, MS, CCRN, CS  
Susan Briggs, MD, MPH

A disaster is a catastrophic event that often leads to great destruction and loss.<sup>1,2</sup> Logue<sup>1</sup> defines a disaster as an event that causes excessive morbidity and mortality. Extensive damage to property, roadways, electrical lines, and other crucial infrastructures limits a region's ability to respond.<sup>1,2</sup> Whether the origin of the disaster is natural or attributable to human causes, the outcomes can be devastating. These events often leave the local first responders, medical systems, and governmental operations overwhelmed. At that saturation point, a disaster is declared and a needs assessment is begun. Historically, the Federal Emergency Management Agency has been the branch of the federal government designed to coordinate efforts during a disaster. From 1990 to 1999, the agency spent more than \$25.4 billion on declared disasters, compared with \$3.9 billion for the preceding 10-year period. During the 1990s, 460 major disasters were declared, higher than any other decade on record.<sup>2</sup>

In 2001, in response to recent terrorist attacks and the risk of

future assaults, the governmental structure was changed. This change has been regarded as one of the largest modifications in governmental structure in years. The Department of Homeland Security is now the central organization overseeing many different agencies that focus on the safety and security of the United States such as the Federal Emergency Management Agency, the Transportation Security Administration, the Coast Guard, and the National Disaster Medical System (NDMS). The focus of the Department of Homeland Security includes border and transportation security; chemical, biological, and radiological countermeasures; informational analysis and infrastructure protection; and emergency preparedness and response.<sup>3</sup>

### Authors

*Erin Cox is a nurse in the emergency department at Massachusetts General Hospital in Boston, Mass.*

*Susan Briggs is an attending general and trauma surgeon at Massachusetts General Hospital in Boston. She is also the commanding officer for IMSURT East.*

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**CE** This article has been designated for CE credit. A closed-book, multiple-choice examination follows this article, which tests your knowledge of the following objectives:

1. Describe what constitutes a disaster
2. Discuss the role of the National Disaster Medical System
3. Describe the role of critical care nurses in a disaster

Providing medical disaster relief is under the jurisdiction of the NDMS. The NDMS works in conjunction with local fire, police, and emergency medical services to provide comprehensive disaster relief

through appropriation of effective resources. One component of the NDMS involves civilian, volunteer disaster response teams known as disaster medical assistance teams (DMATs). These teams are used in disasters that occur within the United States and its territories. Recently, this concept was expanded to include the international community. These teams, known as international medical/surgical response teams (IMSURTs), will be able to broaden the scope of disaster medical response by making resources available to more areas. More persons will be able to receive medical care at a desperate time, and this capability will ultimately decrease the morbidity and mortality of victims of disasters.

The goal of this article is to articulate the role of critical care nurses in a calamitous event. The experiences of the Boston disaster team (IMSURT MA-1) are used to highlight important aspects of disaster nursing. The significance for nursing in the area is 2-fold. First, statistics indicate that the number of natural disasters continues to grow.<sup>2</sup> Further, because of current attacks and threats of terrorism in our society, critical care nurses are in a unique position to participate in all aspects of disaster response, including triage, stabilization, definitive care, and evacuation.

### IMSURT Operations

Building on the primary mission statement of DMATs, the IMSURT concept allows a broadening of the level of care to a global scope, affords resources to austere environments, and supports infrastructures with limited emergency response systems. Only 3 IMSURTs are currently in the United States; however, we postulate

that these resources would be of great value in today's volatile society.

The IMSURTs support local infrastructures in a variety of ways. Medical assistance can be provided in many forms, such as treating victims in the field or supporting the local health centers or hospitals. IMSURTs also have the capacity to care for patients in a mobile shelter known as a DRASH (deployable rapid assembly shelter hospital). In any medium, the DMATs or IMSURTs can greatly support overwhelmed emergency medical response systems and local hospitals.

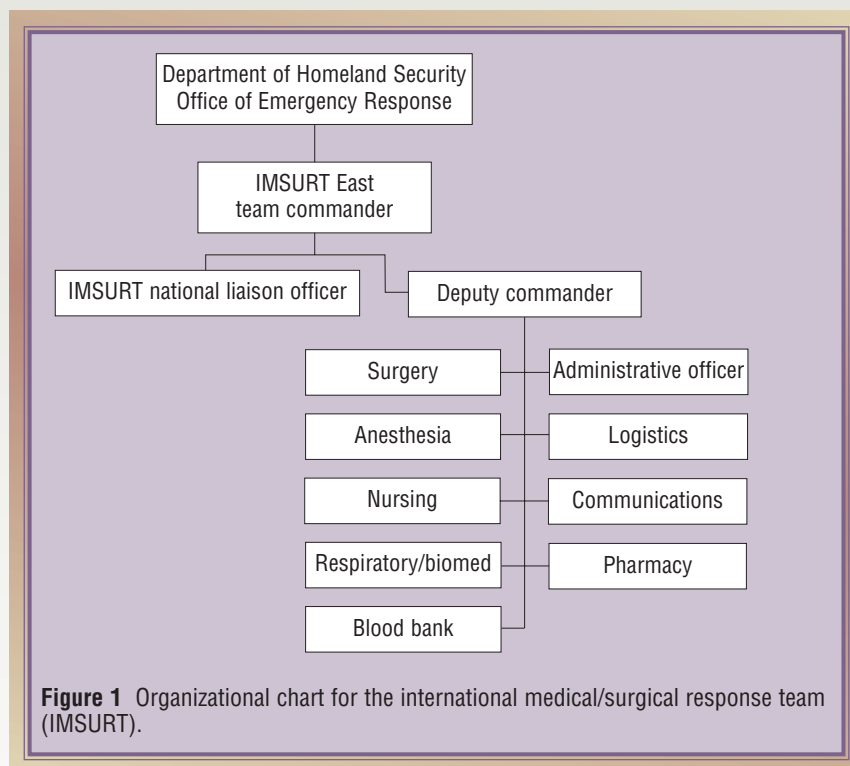
Activation of the international disaster team varies slightly from activation at the national level. Within the United States, the governor of the state involved must make the petition for a declaration of a disaster to the president. The Stafford Disaster Relief and Emergency Assistance Act (amended in 2000) delineates the allocation of resources and monies to

affected areas.<sup>4</sup> For international purposes, the activation decisions are made in collaboration between the NDMS and the US Department of State. Deployment of a specific team depends on several factors, including team capabilities, readiness to deploy, and previous activations; the ultimate decision is based on an effort to correlate the needs of the victims with the appropriate resources.

The declaring agency is responsible for determining how the group will get to the disaster area. Transit may be by any means necessary. Often military planes or trucks are required because of the large volume of supplies and the DRASH.

### IMSURT MA-1

The team in Boston (DMAT/MA-1) was formed in 1987 and joined the first IMSURT (MA-1) founded in 2000. Based in Boston, IMSURT MA-1 (Figure 1) is always ready to deploy a



**Figure 1** Organizational chart for the international medical/surgical response team (IMSURT).

self-sufficient trauma team within 4 to 6 hours of request. During the past few years, however, IMSURT MA-1 has expanded to include subspecialties such as pediatric, orthopedic, and burn components. This expansion has increased the efficacy of the team in providing disaster care because the teams can deploy independently, as a conjoined unit,<sup>5</sup> or as a supplement to other response teams.

## Critical care nurses possess unique skill sets that allow the nurses to be highly effective in disaster response, including a diverse knowledge base, assessment skills, and a strong commitment to public welfare.

As previously stated, the IMSURT MA-1 is fully self-sustaining and carries a large cache of supplies, including food, water, medicine, and equipment. The DRASH allows the team to function as a small independent hospital complete with a triage area, operating rooms, and an intensive care unit.<sup>6</sup> MA-1 comprises more than 150 volunteer members and includes nurses, physicians, paramedics, pharmacists, respiratory therapists, x-ray technicians, nonmedical personnel, and communications/logistics officers. Teamwork is essential because the individual team members are responsible for the location, setup, and maintenance of the DRASH.

Being prepared is one of the key elements of disaster response. To meet that goal, MA-1 has several logistics days that involve equipment evaluation, storage, and inventory. Detailed databases provide a catalog

of equipment and supplies for ease of travel and accessibility.

The supervising medical officer sets the training standards. Educational offerings include 2 training weekends per year (1 weekend is mandatory) with both didactic and skill station components. Lectures focus on triage, basic or advanced trauma care, scene management, basic tactical medical operations,

and transport of patients. With a new focus of a post-9/11 civilization, current lectures have highlighted radiological, chemical, and biological/hazardous materials incidents.

### Implications for Nursing

Some of the fundamental concepts of nursing can be applied to the disaster situation, such as caring, education, advocacy, treatment, and prevention. In 1998, the American Nurses Association collaborated with the American College of Emergency Physicians in a task force designed to develop educational strategies for healthcare workers in a catastrophic event.<sup>7</sup> The American Association of Critical-Care Nurses released a Statement of Commitment to Mass Casualty and Bioterrorism Preparedness (2002) recognizing that critical care nurses will be called on to respond to disaster/mass casualty situations.<sup>8</sup> The statement includes the following:

Bioterrorism and the potential of mass casualties is a significant public health threat facing the United States. The nation's capacity to respond to this threat depends in part on the ability of the health care professionals and public health officials to rapidly and effectively detect, manage, and communicate during an event resulting in mass casualties.<sup>8</sup>

The austere environment of a disaster area is an extended practice arena for critical care nurses. Generally, nurses practice under controlled situations with a plethora of resources at their disposal. This situation is not possible in a disaster setting, where critical care nurses must be able to perform under stressful and often suboptimal conditions. However, critical care nurses possess unique skill sets that allow the nurses to be highly effective in disaster response, including a diverse knowledge base, assessment skills, and a strong commitment to public welfare. These characteristics speak to the need for critical care nurses in disaster settings.

A nurse may be involved in several roles during a disaster. For example, a nurse may function as a triage practitioner. This challenging role requires that several victims be assessed and prioritized quickly to ensure that resources are used appropriately. Jurkovich<sup>9</sup> noted that after the plane had crashed into the Pentagon on September 11, 2001, 44 patients were seen in the triage area within an hour. Among the patients, 9 were critically ill, and 17 were admitted to the hospital.<sup>9</sup> In more

remote areas, treatment of patients may be as brief as stabilization and evacuation to more definitive medical care, or treatment may involve an operating room procedure and monitoring in the DRASH's intensive care unit.

Disasters also cause a great deal of psychological stress immediately after the event, and these effects may persist after stabilization of the situation. How a victim or an emergency provider deals with disaster can be influenced by several factors, including the person's sex, age, marital status, medical and psychological history, and baseline coping mechanisms.<sup>10</sup>

Critical care nurses can have a great influence on persons who experience disaster-related stress by providing education and emotional support. It is imperative to screen and identify the needs of vulnerable populations such as children and disabled and elderly persons. Also, patients who require pharmaceutical support for a preexisting medical or psychiatric illness or others who lack of family and social support may have extensive needs. After the disaster, critical incident stress management may be a beneficial group intervention. This intervention involves a group discussion and allows the participants to share experiences and validate feelings and emotions.

The role of a nurse in specific disaster care depends on the situation, and many functions outside the usual scope of practice are involved. In 1998, ice storms plagued the upper northeastern region of the United

States (Figure 2). MA-1 critical care nurses provided support to the local hospital (Figure 3), visited shelters to assess needs, and assisted the local fire department in assessing homes with suspected high levels of carbon monoxide.

A typical mission could include replacing the actual local hospital with a DRASH or providing an inter-



**Figure 2** Ice storms, Plattsburgh, NY.

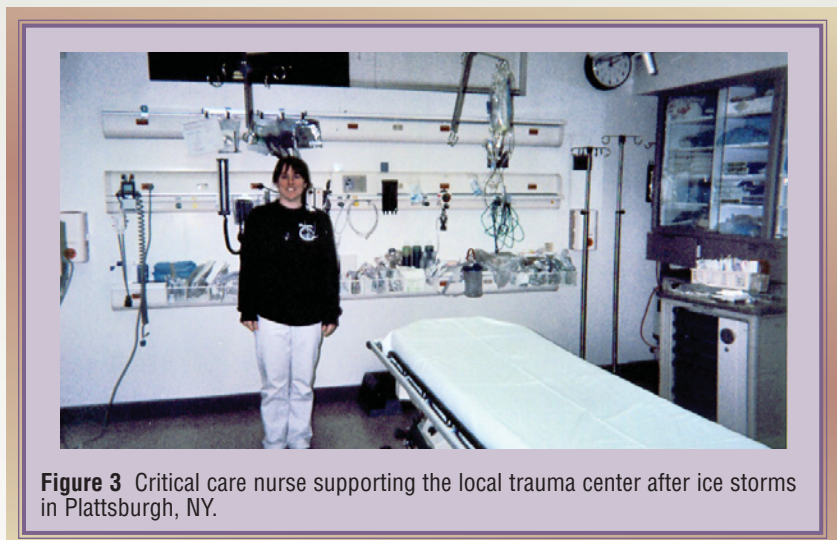
mediary treatment center for localized disasters. The main objectives of the mission may also change as the needs of the victims change. The main point to emphasize is that disaster nurses should be prepared for anything and everything.

Nurses have been on the forefront of medical care throughout the wellness and illness continuum. Now it is time to continue this growth and use our knowledge and skill when it is most desperately needed. It is imperative that nurses become involved in all aspects of disaster care.

### **IMSURT MA-1 in the Field**

The most difficult deployment for the IMSURT MA-1 was the activation on September 11th, 2001, in response to the attacks on the World Trade Center. Eighty members of the IMSURT MA-1 were deployed to New York. The mission began on September 11th and lasted for 14 days. Initially, the team had been activated to assist with

the rescue of victims from the collapse. However, the needs of the rescue workers and construction crews were soon evident. MA-1 IMSURT (in conjunction with 5 other DMAT operations) positioned 5 medical stations around what will be forever



**Figure 3** Critical care nurse supporting the local trauma center after ice storms in Plattsburgh, NY.



**Figure 4** Medical station at “Ground Zero.”



**Figure 6** Member of Boston disaster team examines a child in Guam.

known as “Ground Zero” (Figures 4 and 5). Within these 5 stations, medical personnel treated more than 500 patients each day. The posts operated around the clock. The ailments experienced by the rescue workers



**Figure 5** Some members of the Boston disaster team at “Ground Zero.”

ranged from minor lacerations, eye irritations, and sprains to major conditions such as trauma and cardiac and respiratory difficulties. Some rescue workers wanted to share their stories or sought much needed rest.

September 11th was also the first activation for the burn specialty team. The goal of the team was to support the local burn centers, which were inundated with patients. The team was able to provide assistance within the hospital setting, a situation that resulted in improved care for disaster victims and helped prevent fatigue among the caregivers.

Another deployment experience of the IMSURT MA-1 included providing a medical team to treat postal workers during the anthrax scare in 2001. This urgent situation required thousands of postal workers to be screened and treated with antibiotics as soon as possible. The IMSURT was able rapidly and effectively to assist in achieving that objective.

In January 2003, the IMSURT was activated to Guam in response to a typhoon that struck the region, gravely affecting its medical resources (Figures 6 and 7). The team of more than 35 personnel



**Figure 7** Members of the Boston disaster team assist with pediatric patients in Guam.

joined with 2 other DMATs to provide essential medical assistance through support of the local hospital, field treatment, and health clinics.

### Indications for the Future

Every disaster is a unique challenge. Most likely the role of nurses in disaster medicine will continue to grow. With the institution of the Department of Homeland Security and other readiness initiatives, further training programs for all emergency responders will be initiated. Through the collaborative efforts of federal, state, and local municipalities, as well as an interdisciplinary

approach of all members of the healthcare team, the goal of minimizing traumatic injury and death related to disasters can be a reality. Critical care nurses are an increasingly important part of disaster response and must meet this challenge by expanding the scope of practice.

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