

Disaster Management and the ABA Plan

ABA Board of Trustees† and the Committee on Organization and Delivery of Burn Care‡

This article presents the ABA Plan, developed by the Committee on Organization and Delivery of Burn Care and the Board of Trustees, for the management of mass burn casualties resulting from mass disasters and terrorist acts. Information is presented demonstrating the following: the extent of burn injuries in mass disasters and terrorist acts; the importance of appropriate triage and surge capacity policy; why treatment of burn patients in burn centers is preferable; the critical role that burn centers play in the local, regional, and federal response to mass burn casualty situations; and the important role of the ABA in interacting with federal agencies and other entities in mass burn casualty disaster preparedness.

KEY BACKGROUND FACTS

Burn Injuries Are Common in Mass Disasters and Terrorist Acts. In general, in most traumatic events, approximately 25% to 30% of the injured will require burn care treatment. Approximately one-third of those hospitalized in New York City on 9/11 had severe burn injuries; the Pentagon attack resulted in 11 burn patients, again a high percentage of those injured.

Burn Center Care Is the Most Efficient and Cost-Effective Care for Burn Injuries. Burn injuries are not like other trauma injuries; burn injuries often require a lengthy course of treatment as compared with simple or even complex trauma patients. For example, for burn patients with 50% body surface area burn, the average length of stay in the intensive care unit is 50 days. In a mass casualty, the average burn is typically greater than 50% body surface area.

Burn Centers Are Not the Same as Trauma Centers. Although there are literally thousands of trauma centers in the United States, there are only 132 burn care centers throughout the country, representing 1897 burn beds nationwide. Of the 132

burn centers, only 43 are currently verified through a rigorous joint review program of the American Burn Association (ABA) and the American College of Surgeons to assure the center has the resources for the provision of optimal care to burn patients.

Burn Centers Are a Unique National Resource. Given the unique nature of burn care and the nationwide availability of highly specialized burn care systems established to address the complex nature of burn injuries, burn centers have been specifically recognized in federal bioterrorism legislation, with subsequent action of the U.S. Department of Health & Human Services (HHS) to incorporate burn centers in state and local disaster plans. Furthermore, although most burn surgeons have the expertise and training to treat burn—as well as trauma—victims in the event of a mass casualty, the reverse is not necessarily so, which supports the need for unique benchmarks to ensure that the needs of the burn-injured are met in the event of a terrorist incident.

The American Burn Association Has the Capacity to Be a Key Component in National Disaster Readiness for Mass Burn Casualties. The ABA responded within hours to national and state agencies with burn resource information following the 9/11 tragedies and on an ongoing basis during preparations for the war in Iraq.

DEFINITIONS, SUPPORTING DOCUMENTATION, AND KEY POLICY STATEMENTS

Mass Burn Casualty Disaster. This is defined as any catastrophic event in which the number of burn victims exceeds the capacity of the local burn center to provide optimal burn care. Capacity includes the availability of burn beds, burn surgeons, burn nurses, other support staff, operating rooms, equipment, supplies, and related resources.

Surge Capacity. Surge capacity is the capacity to handle up to 50% more than the normal maximum number of burn patients when there is a disaster. Normal capacity will be different for each burn cen-

ter, may be seasonal, and will vary from week to week or possibly even day to day.

Primary Triage. Primary triage is triage that occurs at the disaster scene or at the emergency room of the first receiving hospital. Primary triage should be handled according to local and state mass casualty disaster plans. Under the federal bioterrorism legislation and the implementation actions of the Health Resources and Services Agency of the HHS, state disaster plans must incorporate burn centers into such plans.

ABA Primary Triage Policy. Burn patients should be triaged to a burn center within 24 hours of an incident. The disaster site incident commander should call the nearest verified burn center regarding available capacity and alternate site burn center information, if needed. Appropriate field triage may depend on first-responder and hospital emergency room personnel knowledge of burn triage recommendations. The ABA's recommended triage decision table—specific for mass burn casualty disasters and not other situations—is in the Appendix to this article.

Secondary Triage. Secondary triage is the transfer of burn patients from one burn center to another burn center upon reaching surge capacity. Secondary triage policy should be put into place at every burn center, with formal written transfer agreements previously established.

ABA Secondary Triage Policy. Secondary triage should be implemented by the Burn Center Director when the burn center's surge capacity is reached. Transfer of burn patients should be to verified burn centers when feasible, then to other burn centers, within the first 48 hours following the incident when possible.

TIERED RESPONSE PLANS

The magnitude of a disaster will determine whether the involvement of local, state or federal government agencies is necessary. It is imperative that all elements of the ABA, from local burn units to the national office, work together efficiently and interact in a similar manner with various federal, state, and local agencies to create the maximum state of preparedness and the most effective response when a burn mass casualty event occurs. Disaster response in the United States is multi-tiered, reflecting limits placed on federal (in particular, the military) involvement in local affairs.

Levels of medical response for a burn mass casualty disaster can be ranked as follows, from most to least likely to be used:

1. State and local response systems
2. National disaster medical system (NDMS)
 - a. Disaster medical assistance teams (DMAT)
 - b. Burn specialty teams (BST)
3. Military support to civil authorities
 - a. U.S. Army special medical augmentation response teams (SMARTs)

Under Homeland Security Presidential Directive 5, the Secretary of the Department of Homeland Security is the principal federal official responsible for domestic incident management. Initial responsibility lies with local and state officials; the federal government assists when state capabilities are overwhelmed or when federal interests are involved.

Implementation of Homeland Security Presidential Directive 5 involves two core documents:

1. National Incident Management System
2. National Response Plan, which includes the NDMS

National Disaster Medical System. NDMS manages and coordinates the federal medical response to major emergencies and federally declared disasters, including natural disasters, technological disasters, major transportation accidents, and acts of terrorism, including those that might involve weapons of mass destruction. NDMS is a section within the Federal Emergency Management Agency in the Department of Homeland Security and works in partnership with the Department of Health & Human Services, the Department of Defense (DOD), and the Department of Veterans' Affairs.

NDMS has three functions:

1. Medical response to the disaster site
2. Patient movement from the disaster area to unaffected areas of the nation
3. Definitive medical care in unaffected areas

Under NDMS, the patient regulation and movement mission is the responsibility of the DOD, and specifically, the Global Patient Movement Requirements Center of the U.S. Transportation Command, Scott Air Force Base, Illinois. NDMS may be activated in four ways:

1. The Governor of an affected state may request a Presidential declaration of disaster or emergency
2. A state health officer may request NDMS activation by the Department of Homeland Security
3. The Assistant Secretary of Defense for Health Affairs may request NDMS activation when military patient levels exceed DOD and Department of Veterans' Affairs capabilities

4. At the request of the National Transportation Safety Board

Once NDMS is activated, Federal Coordinating Center coordinators collect data on the number of available beds and the number of patients who can be processed through a patient receiving area and transported to local NDMS hospitals within a 24-hour period. The DOD operates 24 Federal Coordinating Centers and the Department of Veterans' Affairs operates 37 Federal Coordinating Centers.

It should be noted that in the preparations for the Iraqi war, there was considerable inaccurate information on burn bed availability through this system. The American Burn Association Central Office worked directly with the U.S. Army Institute of Surgical Research to provide much more accurate and timely burn bed availability information.

Disaster Medical Assistance Teams. NDMS helps to develop local DMATs. Each DMAT is sponsored by a major medical center and is comprised of approximately 35 physicians, nurses, technicians, and administrative support staff designed to provide medical care during a disaster.

Burn Specialty Teams. BSTs are specialized DMATs affiliated with a local DMAT to allow sharing of assets. They are designed to be deployed along with a DMAT to provide burn expertise. DMATs and BSTs provide a community resource for local and state requirements but can also be federalized to support national needs (see above for the three ways in which NDMS can be activated). Since the inception of BSTs, Dr. Susan Briggs has been the coordinating BST Program Manager. Dr. Briggs is a long-time ABA member and provides an excellent liaison between the American Burn Association and NDMS.

BSTs are primarily designed to augment existing local capabilities. As such, deployment may not involve the entire team. A major goal is to have NDMS teams on the scene within 12 hours. The team may direct secondary triage and transfer efforts or assist with evaluation and resuscitation. Each BST is currently led by an ABA member and is comprised of approximately 15 burn-experienced personnel, including the following: one surgeon (team leader); six registered nurses; one anesthesia provider; one respiratory therapist; one administrative officer; and five support personnel selected based on mission requirements.

BST Team 1—Boston, Medical Director, Robert Sheridan, MD (*rsheridan@partners.org*)

BST Team 2—Tampa, Medical Director, David Barillo, MD (*dbarillo@earthlink.net*)

BST Team 3—Galveston, Medical Director, David Herndon, MD (*dherndon@shrinenet.org*)

BST Team 4—Minneapolis/St. Paul, Medical Director, William Mohr, MD (*William.j.mohr@healthpartners.com*)

Two more BSTs are currently planned. All BSTs are looking for additional volunteers. When a BST is activated, team members become federal employees during activation, which provides liability coverage and obviates state licensure needs.

Clearly, there are limitations of the current NDMS system regarding BSTs: not all burn centers are members of NDMS; burn centers that are not located in one of the NDMS metropolitan areas would not receive burn casualties under the NDMS system; some hospitals that report burn bed availability to the NDMS do not ordinarily care for burn patients.

ABA NDMS POLICY

For purposes of NDMS involvement in regional burn disasters, the ABA recommends that the primary function of the NDMS disaster teams should be to assist the local burn center director with secondary triage of burn patients to other burn centers, according to the following prioritization:

1. Burn centers currently verified jointly by the ABA/American College of Surgeons
2. Other burn centers

ABA BURN BED AVAILABILITY POLICY

The ABA's Central Office is working with the U.S. Department of Health and Human Services Office of Public Health Emergency Preparedness to establish and maintain a real-time burn bed availability program for the nation. In the recent past, the ABA worked with the U.S. Army Institute of Surgical Research on a burn bed resource capacity project. The ABA Central Office will continue to work with HHS and others to develop and maintain a real-time burn bed resource capacity reporting system.

MILITARY SUPPORT TO CIVIL AUTHORITIES

Military support to civil authorities is the final tier in the nation's disaster response system. Federal resources that may be implemented in the event of a major biochemical or radiation disaster are the U.S. Army Special Medical Augmentation Response Teams. The mission of the

SMART teams is to provide short-duration medical liaison to local, state, federal, and DOD agencies responding to disasters, civil-military cooperative actions, humanitarian assistance missions, weapons of mass destruction incidents, or chemical, biological, radiological, nuclear, or explosive incidents. There are 37 SMART teams, including two burn SMART teams operated by the U.S. Army Institute of Surgical Research, Brooke Army Medical Center, Fort Sam Houston, Texas.

Since direct involvement of the DOD in a domestic incident is considered beyond NDMS and is intended to be limited in extent and duration, the burn SMART teams have not yet been used under military support to civil authorities and have been used primarily for long-range air-medical evacuation of combat burn casualties or for assistance to foreign governments following mass casualty events.

ABA BURN SMART TEAM POLICY

The ABA recommends that, if needed, the involvement of burn SMART teams in regional burn disaster management should be in facilitating secondary triage and transport of burn patients to burn centers outside the disaster area.

ABA ACTION ITEMS ON DISASTER PREPAREDNESS

In addition to greater interaction between the American Burn Association and HHS, the Department of Homeland Security, NDMS, and U.S. Institute of Surgical Research, the following are a number of specific action items that will be taken to enhance overall mass burn casualty disaster preparedness at the national, regional, and local level.

1. Distribution of the publication “Burn Care Resources in North America” to the disaster planning agency in every state.
2. Communication to the nation’s 33,000 fire departments of the availability of burn center resource information and triage recommendations on the ABA Web site, as well as the availability of burn center transfer stickers with specific burn center contact information for their area that are designed for placement on first-responder incident boards.
3. Communication to fire departments and other first responders, hospital emergency room physicians in the nation’s 7000 hospitals, and others regarding the availability of advanced burn life support (ABLS) training through both the

traditional ABLS courses and the new Web-based ABLS Now© course.

4. Provision of a laminated burn transfer criteria guide to all hospital emergency rooms in the nation, to also contain reference to ABA Web site information on verified and other burn centers in their area.
5. Work with the U.S. Departments of Health & Human Services and Homeland Security to assist in the development of mass burn casualty disaster planning at the federal level to include the following:
 - a. Provision of “Disaster Management and the ABA Plan” and other resource information, such as the ABA’s “Burn Care Resources in North America” to relevant federal disaster planning agencies, including information on ABA Web site access for ongoing updates and ABA Central Office contact information.
 - b. ABA development, in conjunction with HHS, the Department of Homeland Security, and private sector entities, of a real-time communication system for burn bed, as well as supplies and personnel, availability.
 - c. Surge capacity issue discussion, addressing disaster area (noting the potential desirability of temporary use of burn specialty teams under the National Disaster Medical System to both augment burn services at the disaster area and to assist with secondary triage transfer of burn patients to burn centers outside the disaster area); the potential for deployable burn care facilities; and increasing the number of National Disaster Medical System Burn Specialty Teams.
 - d. Related issues for discussion/possible federal legislation proposals include the following:
 - Compensation for the receiving burn center and burn surgeons when the persons transferred are uninsured
 - Preferential reimbursement for verified burn centers, so that these facilities will survive economically and continue as a national resource for mass disaster preparedness
 - The different levels of burn supplies that should be in reserve in the National Strategic Stockpile overseen by the Centers for Disease Control and Prevention in HHS for different numbers of mass disaster burn casualties and interacting with efforts such as the “Customs Trade Partnership Against Terrorism” and the industrial hotline to obtain supplies in a disaster, and drawing on the expertise of the American Association of

- Tissue Banks relative to the availability/transport of skin for burn victims
 - Possible grant funding and/or legislative initiatives to increase the supply of burn surgeons and nurses through educational loan forgiveness and fellowship support
 - Federal grants to increase widespread knowledge of initial burn evaluation and treatment through ABLS and the expansion of ABA's National Burn Repository program to better ascertain resource needs in disaster situations and the most effective triage and care components
6. Encourage all burn centers to execute a Burn Center Transfer Agreement with other burn centers, because secondary triage transfer from one burn

- center to another will require a transfer agreement. (The ABA will give consideration to requiring burn center transfer agreements to be in place for verification.)
7. Encourage incorporation into the hospital-specific disaster plan of ABA-recommended triage plan for burn casualty mass disaster situations and provide outpatient care for nonintubated patients with burns covering <20% TBSA; also, address issues of communication with families, psychological support needs, and media control.
8. Communication systems to ensure the ability of ongoing communication among emergency personnel, hospitals, and disaster response coordinators are a critically important issue that needs to be addressed on the federal, state, and local levels.

Appendix

Age/TBSA Survival Grid

Provided by Jeffrey R. Saffle, MD
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CAVEAT: This grid is intended only for mass burn casualty disasters where responders are overwhelmed and transfer possibilities are insufficient to meet needs.

This table is based on national data on survival and length of stay.

Triage Decision Table of Benefit-to-Resource Ratio based on Patient Age and Total Burn Size

Age/ years	Burn Size (%TBSA)									
	0 – 10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91+%
0-1.99	High	High	Medium	Medium	Medium	Medium	Low	Low	Low	Expectant
2-4.99	Outpatient	High	High	Medium	Medium	Medium	Medium	Low	Low	Low
5-19.9	Outpatient	High	High	High	Medium	Medium	Medium	Medium	Medium	Low
20-29.9	Outpatient	High	High	High	Medium	Medium	Medium	Medium	Low	Low
30-39.9	Outpatient	High	High	Medium	Medium	Medium	Medium	Medium	Low	Low
40-49.9	Outpatient	High	High	Medium	Medium	Medium	Medium	Low	Low	Low
50-59.9	Outpatient	High	High	Medium	Medium	Medium	Low	Low	Expectant	Expectant
60-69.9	High	High	Medium	Medium	Medium	Low	Low	Low	Expectant	Expectant
70+	High	Medium	Medium	Low	Low	Expectant	Expectant	Expectant	Expectant	Expectant

Outpatient, survival and good outcome expected without requiring initial admission; *high benefit/resource*, survival and good outcome expected (survival ≥90%) with limited/short-term initial admission and resource allocation (length of stay, ≤14 days, one to two surgical procedures); *medium benefit-resource*, survival and good outcome likely (survival, >50%) with aggressive care and comprehensive resource allocation, including initial admission (≥14 days), resuscitation, multiple surgeries; *low benefit-resource*, survival and good outcome <50%, even with long-term, aggressive treatment and resource allocation; *expectant*, survival <10% even with unlimited, aggressive treatment.

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