ROLE OF ANESTHESIA AND SURGERY IN DISASTER RESPONSE

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Responding to Crisis

- Historically, multi-disciplinary anesthesia and surgical teams have played a significant and ever-expanding role in meeting the challenges of providing medical care in natural and man-made disasters, both nationally and internationally.
Disaster Response

- Anesthesia and surgical specialists are uniquely qualified to participate in all aspects of disaster medical response because of their expertise in rapid decision making, triage, resuscitation, damage control surgery and critical care.
Lessons from previous disasters are important in establishing key priorities in disaster medical response.
KEY PRIORITY

- Disaster medical care is NOT the same as conventional medical care.
Disaster Medical Care

- Requires a fundamental change in the approach to the care of victims

- “CRISIS MANAGEMENT CARE”
Crisis Management Care

- Minimally acceptable, NOT maximally acceptable, care in the acute phase of the disaster due to large number of victims.
Objective of CONVENTIONAL Medical Care

- Greatest good for the INDIVIDUAL PATIENT
Conventional Medical Care

- **Severity** of injury/disease is major determinant for medical care.
Objective of DISASTER Medical Care

- Greatest good for the GREATEST NUMBER OF PATIENTS.
Determinants of Medical Care in Disasters

- Severity of injury
- Likelihood of survival
- Available resources (personnel, logistics, evacuation assets)
KEY PRIORITY

- Disaster responders can **NOT** utilize traditional command structures when participating in disaster response.
The Incident Command System/Incident Management System is the accepted standard for all disaster response.
Incident Command System

- Functional requirements, **NOT TITLES**, determine the organizational hierarchy of the ICS structure.
Today’s disaster teams are based on “FUNCTIONAL“ capabilities (anesthesia, surgery, obstetrics, burns, orthopedics, critical care, etc.) NOT TITLES.
KEY PRIORITY

- Deployment of disaster assets appropriate to meet disaster needs.
Disaster Response

- Similar to the ABCs of trauma and cardiac care, disaster response includes basic elements that are similar in all disasters.
  - **Medical Concerns**
  - **Public Health Concerns**
ABC’s of the Public Health Response

- Food
- Water
- Shelter
- Sanitation
- Security/Safety
- Transportation
- Communication
- Epidemic/endemic diseases
ABC’s of the Medical Response

- Search and rescue
- Triage
- Definitive medical care
- Evacuation
Rapid assessment by experienced personnel as to the appropriate assets needed to respond to the disaster is the first priority.
Search and Rescue: 1st Priority
Many countries, including the USA, have search and rescue teams. Anesthesia and surgical responders are critical assets of these teams.
Triage: 2\textsuperscript{nd} Priority

- Disaster triage is \textbf{NOT} the same as conventional medical triage.

- Disaster triage is the most important, and \textit{psychologically most difficult}, mission of disaster medical response.
Disaster Triage

- A **dynamic** decision-making process of matching patients’ needs with available resources.

- Many mass casualty incidents will have **multiple** levels of triage as patients move from the disaster scene to definitive medical care.
In a mass casualty event, the **critical patients** with the **greatest chance of survival** with the **least expenditure of time and resources** (equipment, supplies and personnel) are prioritized to be treated first.
3 Levels of Disaster Triage

- **Field triage** (Level 1)
- **Medical triage** (Level 2)
- **Evacuation triage** (Level 3)
The level of disaster triage will depend on the ratio of **CASUALTIES** to **CAPABILITIES**
Field Triage (Level 1)

- Victims designated as “acute” or “non-acute”
- Color coding may be used:
  - Acute = RED
  - Non-acute = GREEN
Boston Marathon

- Effective field triage by EMS resulted in equal distribution of “acute” victims to all Boston trauma centers.
Medical Triage (Level 2)

- Secondary triage
- Field or fixed hospital facilities

*Deli used as triage station by disaster teams at Ground Zero*
DISASTER TRIAGE

URGENT

DELAYED

MINOR

DECEASED

DISASTER TRIAGE
Challenge in Disaster Triage: The “Expectant” (Palliative) Category

- Victims not expected to survive due to severity of injuries or underlying disease and/or limited resources.

Sarin Gas Victims, Syria
Criteria for "Expectant" Category?

- ? Cardiac arrest on scene
- ? Co-morbid diseases
- ? Requirement for intubation and ventilation on scene
- ? Age
- ? Head injury
Evacuation Triage (Level 3)

- Prioritizes disaster victims using same color classification as medical triage.
Triage errors, in the form of under-triage and over-triage, are always present in the chaos of mass casualty incidents.
Over-Triage

- Assignment of non-critical survivors with no life-threatening injuries to urgent category

- The higher the incidence of over-triage, the more the medical system is overwhelmed.
  
  (example Tokyo Sarin attacks)
In mass casualty incidents, especially explosions, triage errors more commonly involve over-triage than under-triage.
Children

- Medical providers often over-triage children due to the emotional impact of injured children on medical responders.

*Orange crate serves as pediatric evacuation stretcher, El Salvador earthquake*
Under-Triage

- Assignment of critically injured casualties requiring immediate care to a delayed category.

- The higher the incidence of under-triage, the greater the delay in medical treatment.

- Under-triage leads to increased mortality and morbidity.
Contemporary Disaster Response Organizations

- Military
- Government
- Hospital Units
- Non-Profit Organizations (NGOs)
National Disaster Medical System

- Congressionally mandated
- Federal Disaster Plan for the USA
  - Hospital Bed Capacity
  - Disaster Medical Assistance Teams (DMAT)
  - Trauma and Critical Care Teams (TCCT)
United States
Trauma and Critical Care Teams (TCCT)

- Deployable, rapid assembly field hospital
- Capacity for initial stabilization, operative interventions, critical care and evacuation
- “Federalized” multi-disciplinary medical response teams.
The US Medical Response to the Haiti Earthquake
US Medical Field Hospital
US Field Hospital

- 3000 patients
- 300 operations (conscious sedation + general anesthesia):
  - ✓ 50% orthopedics
  - ✓ 50% general surgery
EARTHQUAKE INJURIES
TRAUMA
OBSTETRICS
PEDIATRICS

IT'S A SMALL WORLD HÔTEL

du HAITI
Acute Care Surgery
Endemic Diseases

- Malaria
- TB
- HIV
- Tetanus
- Meningococcal Meningitis
Neonatal Tetanus

- Many children had to be classified as "expectant" victims.
Goal of Disaster Response

- Reduce the **critical mortality** associated with the disaster.

- **CRITICAL MORTALITY** is defined as the percentage of survivors who subsequently die.
Determinants of Critical Mortality

- Triage accuracy, particularly incidence of over-triage
- Rapid movement of patients to definitive medical care facility (fixed or mobile)
- Damage control surgery
- Coordination of regional disaster preparedness and response.
In a disaster, everyone is our neighbor regardless of political, ethnic, cultural or geographic constraints.
Sharing our expertise with the world’s most vulnerable populations during a disaster is a RESPONSIBILITY as well as a PRIVILEGE.
THANK YOU!