The Role of EMS in Health Emergency Management

David C. Cone, MD
Chief, Division of EMS
Associate Professor of Emergency Medicine & Public Health
Yale University School of Medicine

Traditional EMS Roles

- A. Triage
- B. Treatment
- C. Transport

A. Triage

- Triage of disaster patients is thought to be a key function of EMS personnel
- BUT
- We know essentially nothing about the science of mass casualty triage.

"Trauma Triage" Schemes

- "...involves an estimation of injury severity at the scene of the accident and the subsequent matching of patient needs with available resources."*
  - Triage Index
  - Trauma Score
  - CRAMS Scale

*American College of Surgeons Committee on Trauma. Field categorization of trauma patients. *ACS Bulletin.* 1986;71:17-21.

Mass Casualty Triage

- Simple Triage And Rapid Transport
- Triage Sieve & Triage Sort (UK)
- CESIRA Protocol (Italy)
  - Coscienza, Emorragie, Shock, Insufficienza respiratia, Rotture ossee, Altro

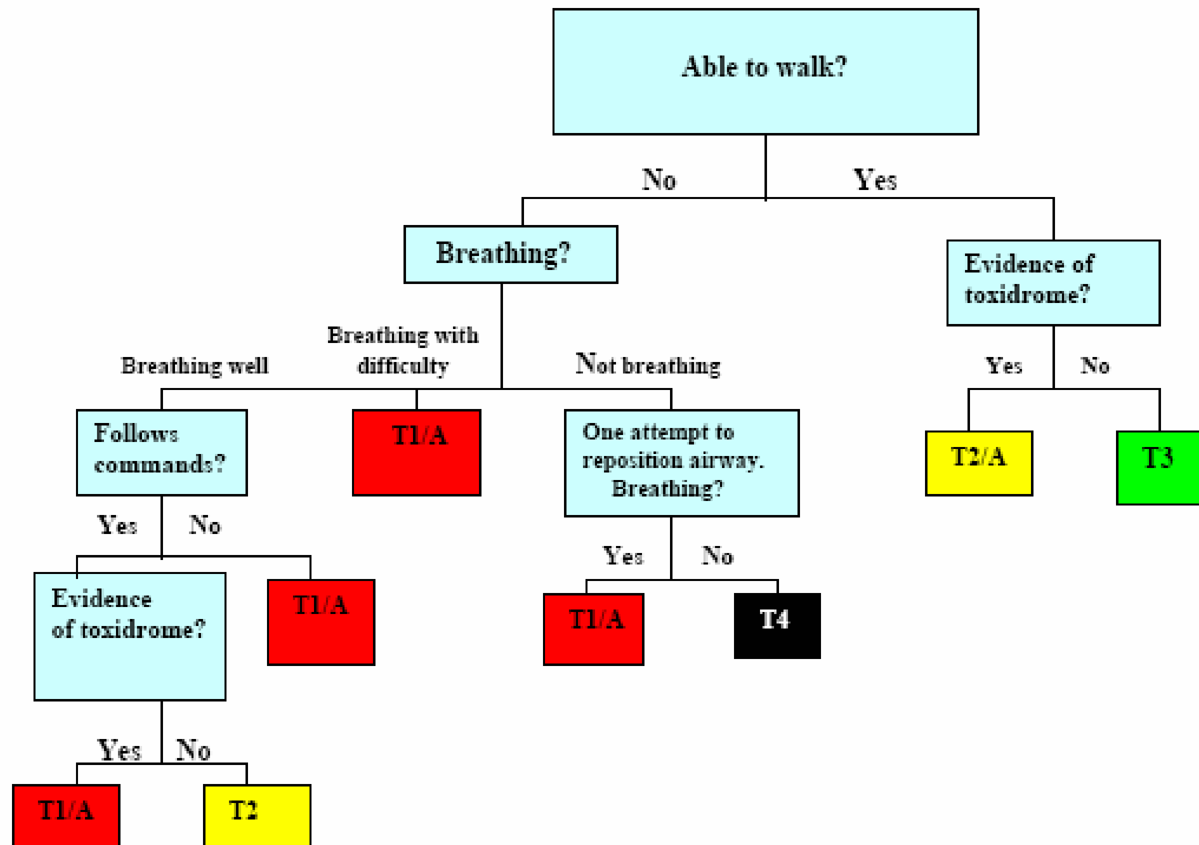
Mass Casualty Triage: Does It Work?

- No "gold standard" against which to measure the performance of a triage system.
  - Does sorting patients into categories result in better patient care for any of them? Does sorting help operationally?

Mass Casualty Triage: Does It Work?

- No outcomes-based studies of any mass casualty triage system have been published.
  - Are any of the systems any "better" than simple provider judgment?
  - Do any of the systems accurately <u>predict</u> patient outcome (as some of the trauma triage schemes do)?

CBRN Environment



B. Treatment

- How much treatment can or should be provided on scene by EMS personnel during a disaster?
- Often depends on availability of treatment and transport resources.

Secondary Assessment of Victim Endpoint (SAVE)

- Three groups:
  - those who will survive regardless of whether they receive care
  - those who will die even with maximal efforts allowed by the limited resources available
  - those who will benefit significantly from the austere interventions possible

Benson M, Koenig KL, Schultz CH. Disaster triage: START, then SAVE--a new method of dynamic triage for victims of a catastrophic earthquake. *Prehospital Disaster Med.* 1996;11:117-124.

C. Transport

- Many victims (often the majority) arrive at hospitals unannounced, not via EMS.
  - Oklahoma City: pickup trucks
  - Tokyo sarin attack: taxi
  - 9/11/05: ambulatory

Transport

- Systems must anticipate that victims will bypass established triage centers, decontamination areas, and other control points.

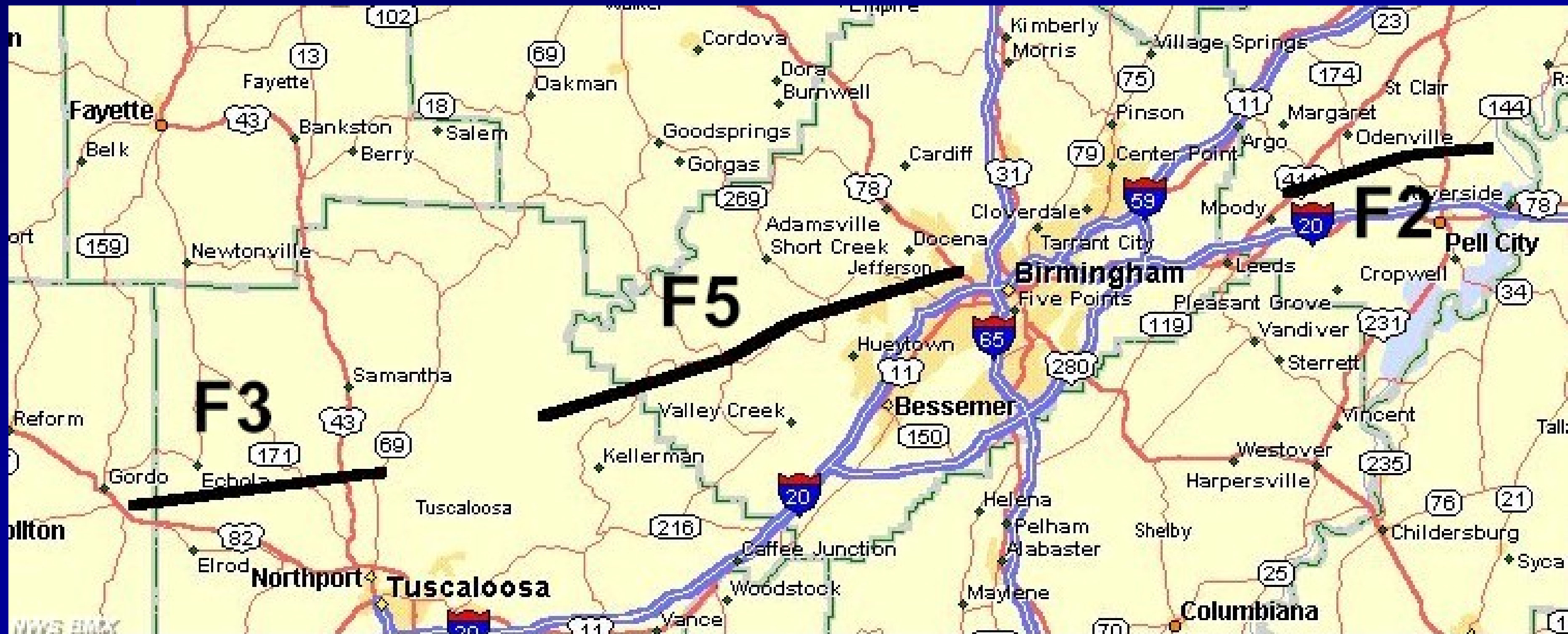
Less Obvious EMS Roles

- D. Communications
- E. Inter-facility transport
- F. Incident command

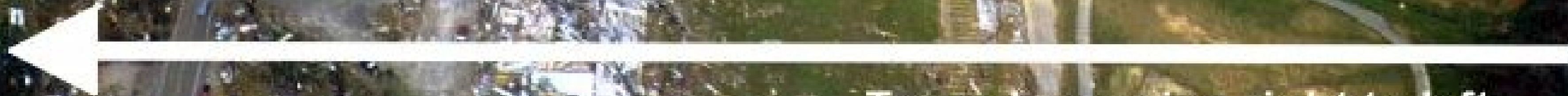
D. Communications

- Dispatch – can be a hub for disaster communications, if:
  - Redundant & resilient
  - Integrates all parts of the system - hospitals as well as field units

8 April 1998: Alabama Tornado Paths



Oak Grove School



NWS BMX

NWS BMX

Journal of Trauma

- "...an organized trauma system with an integrated communication component may significantly enhance the ability to care for injured patients after disasters."

May AK, McGwin G, Leland L, et al. The April 8, 1998 tornado: assessment of the trauma system response and the resulting injuries. J Trauma 2000; 48: 666-672 .

Regional Trauma System

- City of Birmingham and six surrounding counties
- 18800 km^2 (7264 square miles)
- 1.2 million population
- 160 EMS agencies
- 24 hospitals – 10 participate in system
  - 3 level-I (one is pediatric only)
  - 6 level-III
  - 1 level-IV

Trauma Communications Center

- Continuous monitoring of each facility's status
- Routes patients based on availability of resources at trauma centers
- Attempted to match all severely injured patients with Level-I centers as per stated objectives of regional disaster plan

Results

- 224 patients transported, seen at 9 hospitals
  - 63 admitted (two died)
  - 161 discharged

- Records found for 191 (85%)
  - Including all 63 admitted patients

Results: Triage

- Level-I
  - 75 patients at three hospitals
  - 55% admitted, mean ISS 12.2
- Level-III
  - 88 patients at four hospitals
  - 17% admitted, mean ISS 5.5
- Non-trauma centers
  - 28 patients at two hospitals
  - 29% admitted, mean ISS 2.3

Results: Transport

- 88 (46%) by EMS over 5.5 hrs
- 89 (47%) by private vehicle
- 14 (7%) unknown

- 83% of admitted patients arrived by EMS

Findings

- No patients with life-threatening injuries (ISS>20) went to hospitals other than Level-I trauma centers
- Only two patients who survived the initial impact died later
  - Both had severe closed head injuries

E. Inter-facility transport

- 1. Movement of disaster patients from "lower" to "higher"/specialized care
  - (Though if you have your system set up well, this may not be needed – e.g. Birmingham)

- Hospital transport teams?
- Air medical services?

E. Inter-Facility Transport

- 2. Creation of surge capacity at hospitals by outbound movement of patients (“back-transports”)
  - Home
  - Skilled nursing facilities
  - Non-trauma centers (?)

9/11/2001 – New Haven

- Yale-New Haven Hospital:
  - 19 ambulances
  - 17 wheelchair vans
- Hospital of St. Raphael
  - 19 ambulances
  - 14 wheelchair vans
- Average daily call volume = 81

F. Incident Command

- Used to plan, organize, staff, direct and control emergency situations
- Important to integrate field system (all components) and hospital system

Why ICS?

- Command, control, leadership
- Flexible process for ongoing assessment
  - Incident Action Plans
- Unified command for multi-jurisdictional or multi-agency events

Components of ICS

- 1. Common organizational & procedural standards
- 2. Common terminology
- 3. Integrated communications
- 4. Modular organization
- 5. Unified command structure
- 6. Consolidated action plans
- 7. Comprehensive resource management
- 8. Designated incident facilities

Summary

- There are many roles for EMS in emergency health management
- We need to work on the less obvious roles, though not at the expense of the "traditional" roles.
- We need research in a number of areas, to improve the operational and clinical aspects of EMS in disasters.