

## Disaster Response and Triage and START 2 Finish

A disaster response model for the  
community

## Topics

- Disaster Epidemiology
- Evidence Based Disaster Planning
- MCI Triage
- Hospital response model

## Disaster Casualties

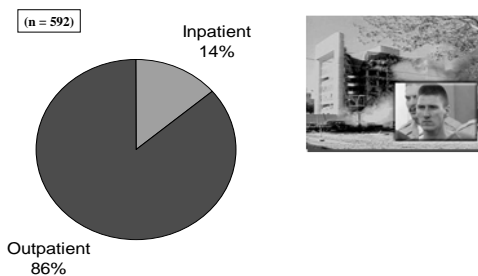
Casualty Severity  
Casualty Types  
Timing of Casualty Flow

## Casualty Severity

- Large majority of victims in disasters have minor injuries
- Sheer number of patients can
  - overwhelm system
  - impair identification of critical patients
  - impair treatment of critical patients

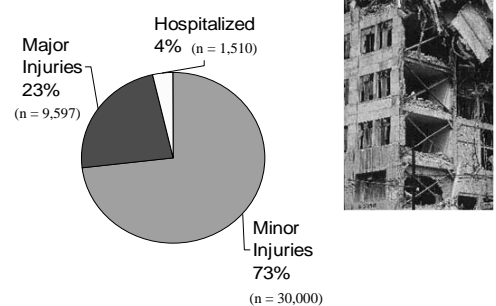
### Casualties Severity - Oklahoma City Bombing (1995)

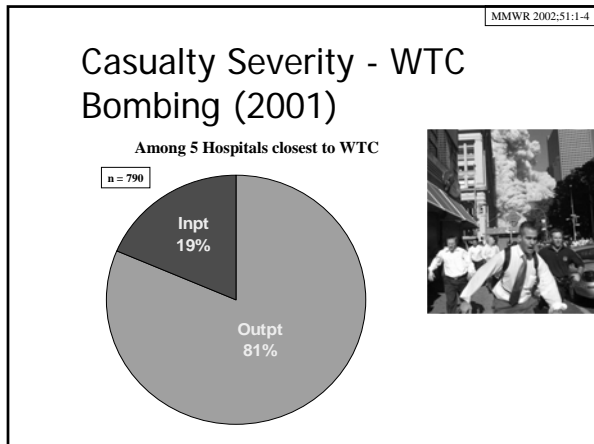
Mallonee s et al. JAMA 1996;276:382-7



### Casualty Severity - Mexico City Earthquake (1985)

Romo RC. J Wild Assoc Emerg Disast Med 1986;4:1-8





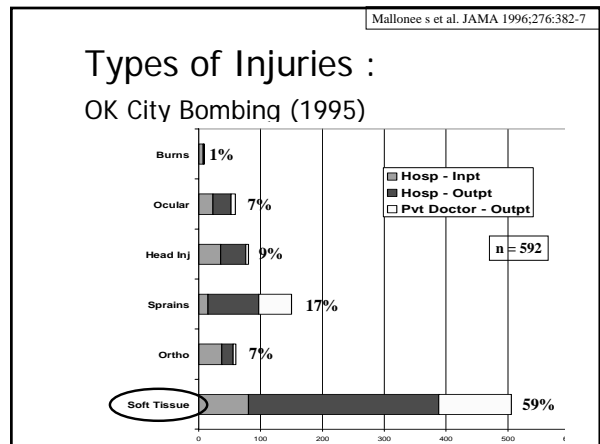
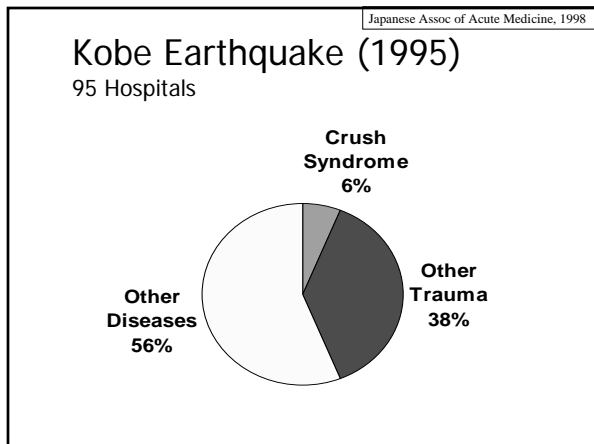
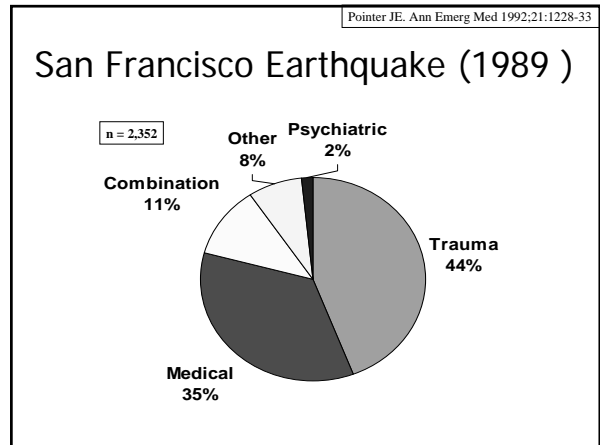
Quarantelli, EL. Delivery of Emergency Services in Disasters: Assumptions and Realities

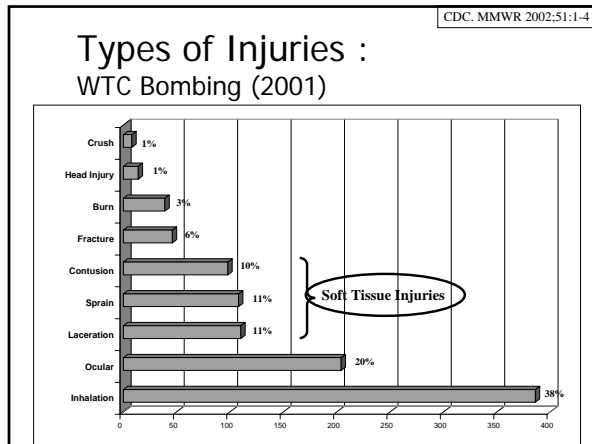
## Hospitalization

- Study of 29 U.S. disasters
- 80% hospitalized < 1 day
- 20% hospitalized ≥ 1 day
- Reflects truncated initial evaluation
- Overtriage a major problem

## Types of Casualties

- Historically, disaster planning focused just on injuries...
- Epidemiology reveals:
  - majority of “casualties” need treatment for non-trauma conditions
  - most common traumatic injuries: soft tissue





### Timing of Casualty Flow

- Casualty flow begins within 30 minutes
- Most casualties at hospitals within 1½ hrs
- Critical casualties are treated at local hospitals
- Minor injuries continue into the clean-up period

### Summary of Epidemiological Findings

- Minor trauma and nontrauma casualties predominate
- Many disaster “casualties” result of
  - clean up activities
  - loss of access to routine medical care

### Summary of Epidemiological Findings

- Most casualties in hospitals within 1-1/2 hours
- May be a large demand for primary care, general public health measures

### Disaster Planning - The Old Paradigm

- Hospital focused
- Critical trauma focus
- Emergency Department involvement only

### Disaster Planning - The New Paradigm

- Maximal use of local assets
- Include nonhospital medical assets
- Anticipate mass care of minor injuries
- Anticipate large numbers of nontrauma cases
- Maximize use of all available resources within facility

# Evidence Based Disaster Planning

*"Disaster planning is only as good as the assumptions on which it is based."*

- E. Auf der Heide, MD

*"Those who ignore history are doomed to repeat it."*

## Typical Assumptions

- Dispatchers will send appropriate units to the scene
- Patients will be
  - triaged & stabilized by EMS
  - decontaminated if necessary
  - distributed to receiving hospitals

## Reality

- Atypical dispatch
- Poor communication
- Initial care from bystanders
- Many pts not transported by EMS

## Atypical Dispatch

- Unsolicited responders
- Notified by news reports or scanners
- Local incident commanders
  - Difficult to communicate, coordinate, or integrate responders

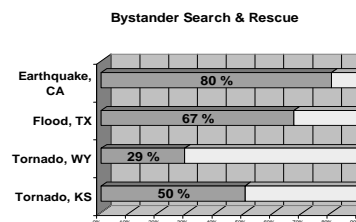
## Coalinga CA, Earthquake (1983)

- Only 16 serious injuries
- 30 ambulances, 5 helicopters
  - from up to 100 miles away
- None requested
- None needed
- Could not be used!



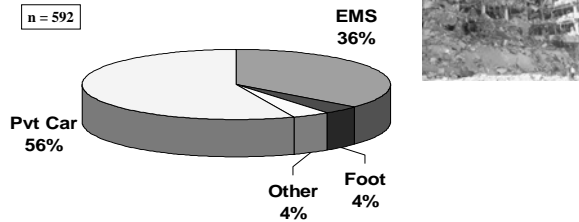
Drabek 1981 U of CO press

## Initial care from bystanders



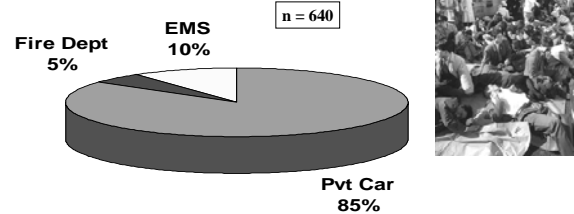
## Many pts not transported by EMS

- OK City Bombing



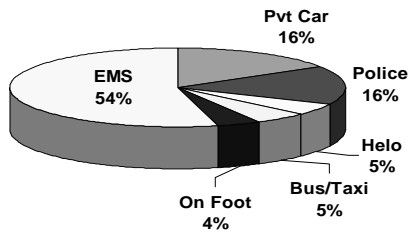
## Many pts not transported by EMS

- Sarin Gas Attack (St Luke Hosp, Tokyo)

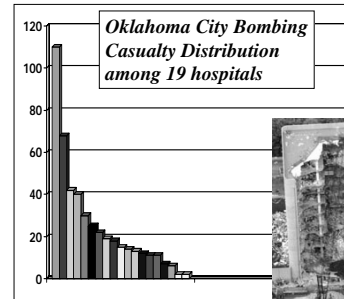


## Many pts not transported by EMS

- Initial arrival mode - 29 US disasters



## Casualty Maldistribution



## Casualty Maldistribution

- Study of 29 U.S. Disasters
  - 75% of cases, >1/2 casualties taken to closest hospital
  - 46% of cases, >3/4 casualties to closest hospital
  - Unused hospitals: average vacancy 20%

## Least Serious Casualties Arrive First

- Least Serious Casualties Arrive First
  - Not entrapped, non-EMS transport
  - Hospitals unaware of more serious cases yet to come
  - When serious cases arrive, all ED beds occupied
- Second wave of more critical patients



## START Triage

- Triage = "Sorting"
- Not a treatment role!
- Only 2 treatments allowed:
  - Open & clear airway
  - Direct pressure to external hemorrhage
- ~30 seconds per patient!

## START Triage

- Four Levels of Triage
  - Red Immediate / Critical
  - Yellow Delayed / Stable
  - Green Minor / "Walking Wounded"
  - Black Deceased / Expectant

## START Triage

- Exclusion criteria - based on rapid assessment of "RPM"
- A**irway / **B**reathing → **R**espirations  
**C**irculation → **P**ulse  
**D**isability → **M**ental Status

## How to Triage

- Announce: "Go over there to get checked in"  
(All walking wounded = Green )
- Assess remaining (non-ambulatory) patients by RPM criteria
- Attach identifying tags or ribbons
- Move on to next patient

## START to FINISH model

Mass casualty response model continues color coding system from field into the hospital

### Goal

1. Maximize effectiveness of existing resources
2. Increase patient care capability
3. Increase surge capacity

## START to FINISH model

1. Define team personnel mix
2. Identify location of each area
3. Determine feasibility of traffic pattern
4. Determine supply need for each area
5. Communication and logistics
6. Discharge Holding Area
7. Universal response standard within HC organization, community, or region
8. Familiarization of 'traveling' staff

## START to FINISH model

Maximize effectiveness of existing resources

### Supplies

Pre-designated location of stocked MCI supply carts

- Cart supplies equal that required to care for patient treatment area acuity
- Having needed resources available increases patient turn around time

## START to FINISH model

Maximize effectiveness of existing resources

### Manpower

- Pre-designated staff response areas
- Correct staff mix in each location
- Clearly marked role of staff in area



START to FINISH model



## Green Station

(Walking Wounded / Minor)

Patients: largest bulk, quickest arrival

Location: No where near ED!

- Assure patients are not contaminated prior to entry
- Patient to D/C Holding after treatment is complete
- Cart supplies: irrigation (eye and wound), dressings, boo-boo stuff, suturing, and ortho supplies

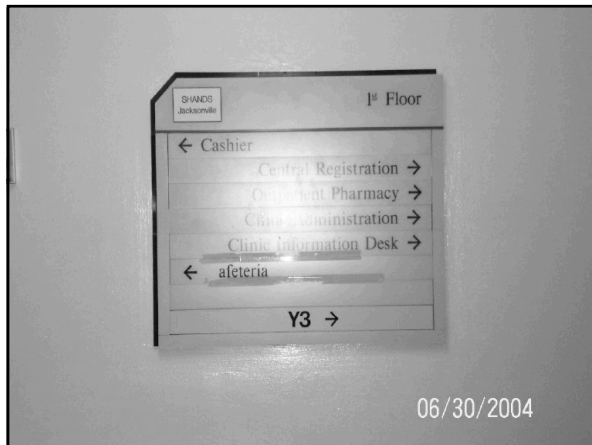


## Yellow Station

(Delayed / Stable)

### Clinical area

- **Equipment and supplies:**
  - suction, O2, x-ray
- **Patient types:**
  - rule outs
  - minor trauma
  - ortho, surgical
- **Staff: mixed specialty skills**



## Red Station

(Immediate/Critical)

### Location

- Trauma Centers, ED's and other critical care capable areas

### Personnel

- Critical care capable
- Clerks, t/port, RT, x-ray, support staff



## MCI Team: BLACK

(Deceased/expectant)

### Personnel

- Final re-evaluation of expected
- Lab or mortuary staff, transportation, clerks, chaplain, nurse, and mental health

### Logistics

- Morgue area and alternate plan for when capabilities are exceeded
- Polaroid camera, photo album, paper bags, body bags

### Man Power Pool

#### Large Hospital Surge Capacity Manpower Assignments

	red	yellow	green	black
• Physician	15	10	5	(id'd but no vest)
• Nurse	10	10	5	1
• Tech	10	10	10	1
• Clerk	10	10	8	
• Escort	10	10	4	
• Lab	5	2	0	2
• Respiratory	5	5	0	
• ARNP	0	1	2	
• PA	0	1	3	
• Radiology	8	4	0	
• Mental health	1	2	3	1
• Clergy	2	2	4	1
• Communication	1	1	3	
• Security	1	1	1	1

## Summary

- Disaster Epidemiology
- Evidence Based Disaster Planning
- MCI Triage
- START 2 Finish model
  - Improved patient flow
  - Improved staff utilization
  - Improved interaction with outside agencies
  - Improved resource utilization
  - Easy and simple

Questions / comments ?

Thank you.

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