Mass casualty incident management: what is the missing piece of the puzzle?

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Introduction

- Steven Kanarian
- Lieutenant FDNY - EMS Command
- 21 year paramedic
- 15 years FEMA USAR
- Program Coordinator, SUNY Rockland Community College EMS Program
SUNY Rockland Paramedic Program

- 1 year paramedic training course
- AAS EMS available
- Real world training
  - Realistic labs
  - Experienced Instructors from region
My 2 cents worth

- College EMS – Way to go!
- Where are you heading
  - EMS Leader, Medical director
  - Mover and shaker
  - Other Career?
  - You are all staying in EMS!
- Follow your heart, life is short, do what you enjoy in life.
- Come to Paramedic Class!!
Objectives today:

- Review classic problems with MCI management
- Review principles of MCI management
- Review lessons learned from MCI’s in recent years
- Identify new trends
- Gain new perspective on training needed to prepare your service to respond and survive a terrorism related MCI
Original research

Assessing the learning objectives required for EMTs and Paramedic responding to MCI’s involving terrorism (2004)

- Thesis for MPH at New York Medical College, School of Public Health
- Poster Presentation National Association of EMS Physicians Conference (January 2006)
- Abstract published Pre-hospital Emergency Care (Winter 2005)
Assessing Objectives

- Literature review
- Historical look at MCI training
- Training principle
- Training available
- Incident review
- Provider survey conducted
- Suggestions for improvement
What is an MCI?

- An incident with 5 or more patients
- Overwhelms 2 ambulances
- Special circumstances

An MCI is any incident where the need for patient care overwhelms the resources available.
Types of MCIs

- Fires
- Building collapses
- Haz Mat
- Natural hazards
- Hi Impact violence (Heat)
- PD tactical incidents (potential)
Problems with Disasters

- Lack of communication
- Lack of control
- Poor resource management
- Organizations working independently rather than one cohesive organization
- Too many Chiefs too few rescuers to do simple tasks
Problems with MCIs

- Lack of communication
- Lack of central command
- Hospitals being overwhelmed
- No life threat stabilization
- Poor triage
- Failure to sort patients

“Delivery of Emergency Medical Services at Disasters”, Quarentelli, 1983
Current Safety Training

- “Scene safety BSI”
- Taught on white board
- Hazards?
- Decisions in real time?
- Practice roles?
- Did you sweat and feel challenged?
- Did you have a chance to apply what was taught?
Current Safety Training

- Geared toward BBP pathogens
- Road hazards
- Natural hazards
- Fires
- Rescue OPS
- Haz Mat Awareness
  - Isolate, protect, identify
National EMS curriculum objectives

- “Given a simulated table-top MCI, with 5-10 patients, conduct a scene survey.”
- “A windshield size-up”
- Number of patients
- Severity of patients
- Resources needed

NHTSA, 1998
EMT Training

- Traditional EMT class
- Lab experience
  - Include labs with triage
  - Sequential learning?
- MCI training?
  - Outdoors with hazards
- Field experience
- Do you feel prepared?
Do you feel prepared to respond to an MCI scenario like this?
Dateline: Atlanta

- January 17, 1997
- Bombing in a office building
- Housed and abortion clinic
- Secondary explosion intended to injure rescuers
- Bomb placed near dumpster in pre-planned command post

Lesson 1: Change what you do routinely.
Columbine Shooting

- School shooting
- Weapons and explosives used
- Medics placed themselves at risk to rescue patients while shooting was on-going
- Emotionally charged
- Community School

Lesson 2: seek hard cover and communicate with law enforcement personnel
Olympic Park Bombing

- August 1996
- Back Pack device detonated
- Steel plate directed blast
- Intended to harm people!!

“When medics see patients they have a tendency to forget the number 1 rule!”

EMS Magazine, 1996
Olympic Park Bombing

- Rescuers were staged nearby to respond rapidly
- EMS providers on the scene caring for patients
- Undetonated secondary device found

When responding to an incident involving explosions, hazardous materials or weapons, the scene must be cleared before personnel enter unless responders are trained and equipped to operate in hazardous environment.
Oklahoma City Bombing

- April 19, 1995, 09:02
- Murrah Federal Building
- Domestic terrorism
- Diesel/nitrate Bomb
- Intended to do harm
Oklahoma City Bombing

- 444 patients treated and released
- 354 treated and released
- 90 patients (20%) admitted to hospital
- 1 responder death,
“Responders were completely unprepared for what they saw...responders to the bombing were faced with large groups of patients and patients with severe injury.”

EMS Magazine, Nordberg, 1995
Oklahoma City Bombing

- Police assisted with rescue instead of establishing a perimeter
- Control of manpower was difficult until a recall because of a possible secondary device found.
- Control important for rescue and patient care
- How could one create a control point of an MCI response?
Oklahoma City Bombing

- Tremendous BBP issues
- EMS branch consisted of triage, treatment, triage and decon
  - Boot wash, clean clothes, food
- Rehab sector used
- Shift work
- CISD—very important, post incident
- Responders had yearly training in MCI response
- Showed importance of disaster plan and practicing the plan
- Responders should train together, not in isolation
- Many patients were transported by private means
Safety Tips

- Safety Officer important
- Look for those cross trained individuals in your department
- Never eat at the site of a Haz Mat job
- Boot wash station
- Change clothes and equipment, vehicles

Rule #3 Time, distance and shielding are your best friends
Tokyo Sarin Attack

- Sarin attack in subways March 20, 1995
- Release of Sarin in 5 subway cars
- Sarin stimulates cholinergic response
  - SLUDGEMS
- Affected experienced rhinitis, constricted pupils and SOB

Effects of Sarin exposure were alleviated by ventilating ambulances and treatment areas.
The numbers

- 11 commuters were killed
- 5,000 persons required medical evaluation

St. Lukes Hospital
- 640 patients arrived for care
- 64 people arrived by ambulance
- 35 by FD vans
- 541 by non-trained motorists

Scene Safety, perimeter control and hospital distribution are key goals in an MCI
- 135 EMTs (9.4%) secondarily affected by Sarin
- Sarin used only 30% strength
- Military strength may have taken EMS providers lives

What was safety lesson #1?
September 11, 2001
World Trade Center attack

- 2 jet liners struck twin towers
- Both collapsed
- 16 acres of land, seven buildings
- Huge unknown health hazards
- Minimal protection
- Inappropriate protection
- 10 EMTs and paramedics killed
- 341 firefighters killed
- Greatest loss of rescuers in history due to terrorism
WTC problems

- Lack of coordinated response
- Lack of integrated ICS
- Lack of interagency communication
- Unexpected structural failure
- Loss of command structure
- Radio failure

*Increasing FDNY’s Preparedness*, McKinsey 2002 can be read on FDNY.gov
- Overwhelmed local hospitals with private transport
- Lack of respiratory protective equipment
- Control of scene took days to achieve
- Impromptu treatments areas set up
Rand Study

“Protecting Emergency Responders, Lessons Learned from Terrorist Attacks”

- Two fundamental issues
  - Inadequate information about hazards
  - Inadequate communication of information

- Cross trained individuals with FD did better

- Many did not have access to equipment they needed
What is missing?

- During any terrorist event harsh decisions may have to be made. Decisions may challenge routine operating procedures.
- CBRN incident may require excluding rescuers from "hot zone".
- Emergency responders do not consider the term "acceptable casualties". Military term hot zone the "kill zone".
Unique problems with terrorist incidents

- “Use of violence, threats, intimidation or information manipulation for revenge, politics or support of furthering a criminal enterprise.”
- Terrorist methods evolve with changes in technology
- More fanatical
- Increasingly likely to use WOMD.
Terrorism

- Terrorism means intentional harm
- Example: Waco was impetus for OKC bombing.
- This heightens response for emergency response personnel.
- “First responders are faced with unfamiliar, unpredictable, and unsafe scene.”

Christen and Maniscalco, 2002
- Rescuers may be target of terrorism
- Survival tactics take training
- Scene safety must be continual and dynamic
  - Appoint look out
  - 2 in 2 out rule
  - Identify escape route and rally point
  - Reevaluate the scene and ask, “what is next”? 
Not likely to use **acceptable losses concept** unless trained and prepared for such extremes.

Unfortunately this may lead to greater loss of life in the emergency response community.

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Emergency Response to Terrorism

Bevalaqua and Stilp, 2002
How do we prepare?

- Understand terrorism means **intentional harm**
- Understand intentional harm means severe injury and mortality
- Recognize need for training and preparation in safety and triage
- Understand this is for real
- Understand it can happen in your locality
- Understand not being ready is unacceptable and potentially deadly!
Terrorism awareness training

- Outward signs of terrorist event
- Time, Distance and shielding
- Knowing outward signs of WOMD attack
  - Explosion with no trauma
  - Sudden onset of multiple patients with medical signs
  - Overwhelming call volume with same symptoms
Haz Mat Awareness

- Isolate
- Protect
- Identify product
- Know container types
- Know emergency action

Does not account for *Intentional Harm*!!
Cross training is best solution

- Haz Mat training
- Rescue training
- Firefighting training
- Tactical EMS courses
- Cross training with PD and Fire
- Cross training with the military
Triage
Triage and MCI response

- EMS mission to care for patients and save lives
  - Scene safety
  - Triage patients
    - Perform life saving treatment
    - Prioritize
    - Sort
    - Re-Triage
    - Transport both timely and efficiently
Elements of triage

- Prioritize patients
- Sort them
- Treat them
- Looking for most survivable not the worst injured
Resources vs. Need

- MCIs vary according to the number of patients and the resources available.
- Decisions spring from these parts of the equation.
Triage basics

- Know the triage system in your region
- Practice triage regularly
  - Fall have MCI and triage lectures
  - Winter have a MCI table-top with triage using index cards
  - Spring have an indoor, multi patient drill with moulage
  - Summer, outdoor large drill
Triage basics

- Triage Tuesday
- Triage tags on all trauma patients
- Triage tags and patients tracking on incidents with 5 or more patients
- Adopt an MCI mindset
  - Use terminology regularly
Hospitals typically get overwhelmed while others have beds available

- School bus accident, split up patients?

- Transport officer is responsible for notification of hospitals and resource availability

- Closest hospital may already be overwhelmed before EMS, arrival - write them off?
What is the missing piece of the puzzle?

- Gap in training
- Lacks realistic, hazard oriented training
- Lacks performance based training in real world
- Lacks training with element of intentional harm
- MCIs have changed so too should our training

EMS providers will do in the real world what they have been trained to do in practice.
What is good training?

- “providers will only do what they have been trained to do.”
- Providers should be given an overview of how MCIs are different and what special techniques are needed.
- Inter-agency training and realistic scenarios
- Night time and in bad weather
How MCIs are different

- Span of control changes from 2 providers and one patient
- Function may be small part of daily routine
  - Communications
  - Triage
  - Safety
  - Vital signs
  - Or simply standing by
- All providers need to work together
- Do the task you are asked to perform
- Do the most good for the most patients
- May leave patients we ordinarily would expend all efforts to save
- May be a target!
State-of-the-Art

- Israeli responders train with CBW and PPE.
- Exercises are a part of the disaster plan
- High fidelity simulators
- Creative ways to simulate hazards
  - Simulate chemicals
  - Use children and relatives of rescuers
  - Moulage sever injuries
    - OKC file cabinet corner found in a man’s chest-challenge personnel
Current training takes place during the daylight and in good weather

Rescuers perform better when using triage tags and real people for patients

The ability to survive an event must be included in the exercise

- ATSO-”ability to survive operations”

Use internet and remote learning technology for individuals to use in down time
Instructors

- Training should be taught sequentially
- Build on skills
- Small one patient drill
- Several patients
- Small exercises
- Then large exercise with other agencies
Example for triage training

- Teach triage in classroom with video and lecture
- Lab with one patient practice variety of life stabilizing treatments
- Then practice prioritizing patient
- Then practice with several patients
- Then several live patients
- Participate in large scale drill
Provider survey results
Survey conducted applying lessons learned and training standards

- 10 questions
- Likert Scale 1 to 5
- Statistical test used – Median Test
- Results are relative because this is self rated ability by EMS providers
- Results are not applicable to other areas
“Survey Says….”

- Conducted survey of EMTs and Paramedics in suburb of NYC which has a high terrorist risk

- 200 surveys mailed
- 51 surveys returned (26%)
- EMT-B 23
- Paramedic 28
“Survey Says....”

- **Experience**
  - EMTs mean of 11.96 years
  - Paramedic 19.4 years of experience
Specialty training

FF Haz Mat ICS START

Medics
EMTs
Summary

- 95% of these providers had Terrorism awareness
- 74% of EMTs took ICS
- 96% of Paramedics had ICS training
- Internet only used for 25% of EMTs and 28% of medics, all had taken classroom version
Recognize Hazards

- Paramedic 2.57
- EMT 2.88

Statistically significant
Recognize Chemical Attack

- Paramedic  mean  2.50
- EMT       mean  1.87

- Statistically significant
Likely to enter a scene

- Paramedics 1.41
- EMTs 1.65

Not statistically significant
Ability to triage

- Paramedics 3.23
- EMTs 2.65

- Statistically significant
What does this mean

- Responders even with high experience and training do not feel overly confident performing objectives
- Paramedics may feel more comfortable recognizing a Chemical attack or performing triage
- Larger study needed
- Measurable evaluation needed
Take Home Points
What kind of training is needed?

- Use triage daily
- Teach providers how MCIs are different from daily OPS.
- Train your EMTs and medics to triage and hide in life threats, time them to discovery and stabilization
- Practice sorting patients, use Index card drills
- Have me come to your school to lecture
Safety rules to live and stay alive by!

- Rule of thumb
- 2-3 times height of building is collapse zone
- Seek hard cover
- 1,500 feet for explosives
- Time, Distance and shielding
- Upwind, uphill,
- Don’t worry about cause, react to hazards
- Listen to multiple radio channels
Keys to real training

- Severe injury moulage
- Weapons on a patient
- Perp among the injured
- Secondary attack
- Think outside the box
- Use hazards
- Train at night and in bad weather
- Use relatives and children as patients
Benchmarking in MCI response

- Collect information about MCI response
- Collect information about triage
- Announce time of triage completion
- Announce last “Red” patient off the scene
  - Creates a benchmark
- Train, Practice and improve
Come by for a visit

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