HUMAN FACTORS IN EMERGENCY MANAGEMENT: PREPARING YOUR HOSPITAL FOR LARGE CROWD EVENTS
AGENDA

• Introduction
• The In’s and Out’s of Crowd Emergencies
• Understanding How to Prepare for Crowds
• Examples and Case Studies of Crowd Emergencies
• Communication Tools to Help Respond to These Events
• How Everbridge Can Help in Crowd Emergencies
• Q&A

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We’ll send out a recording after the event.

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Today’s Presenters:

Steven Crimando, BCETS, CHS-V, Principal, Behavioral Science Applications

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HUMAN FACTORS IN EMERGENCY MANAGEMENT: PREPARING HOSPITALS FOR LARGE CROWD EVENTS
Human Factors in Hospital & Health Care Emergency Management

Special Concerns in Crowd Emergencies

National Guardsmen standing at the entrance to Johns Hopkins Hospital during riots in Baltimore.
About the Presenter

Steven M. Crimando, BCETS, CHS-V

- Principal, Behavioral Science Applications
- Responder
  - ’93 & 9/11 WTC attacks
  - Anthrax Screening Center
  - TWA Flight 800
  - Unabomber victims, international kidnappings
  - Hurricanes Floyd, Katrina, Sandy
- Consultant/Trainer
  - U.S. Department of Justice/FBI & OVC
  - U.S. Department of Homeland Security-FEMA
  - NYPD Counter Terrorism Division
  - Multinational Corporations
  - U.S. Public Health Service
  - U.S. Postal Service
  - UN-Emergency Preparedness & Support Team

25 + years frontline crisis experience including hospital and pre-hospital care
An Invitation: The 3 A’s

- **Adopt**: New information
- **Adapt**: Existing knowledge and skills
- **Apply**: In planning, exercises and real-time emergency response

We will explore key behavioral factors in general emergency conditions and crowd emergencies specific to first responders and first receiver personnel and facilities.
Presentation Assumptions

It is assumed that the hospital or health care facility has:

- Awareness and compliance with standards and guidelines for dealing with disasters, mass casualty events (MCEs) and other emergencies

- Understanding and implementation of the Hospital Incident Command System (HICS)

The level of involvement with a crowd event or emergency will vary greatly depending on:

- Type of facility
- Type of event
- Type and size of crowd
- Proximity to the incident or event
- Capabilities/qualifications of facility and staff

- Other factors

The presentation is designed as a funnel in that it will begin with more broad and general information, and become increasingly specific to hospitals and health care settings, with more actionable information as we progress.
Introduction

- The nature and type of crowd emergencies that may face a community and its hospitals and healthcare systems is changing.

- Crowd emergencies may involve both spontaneous, unplanned incidents as well as anticipated and planned events.

- All types of large crowd events can pose unique challenges for both hospital-based and pre-hospital healthcare providers that are not typically addressed in mass casualty event planning.

- This program will introduce key areas of concern and considerations for planners.

Crowds of a million or more were common on the Pope’s recent tour in the U.S. and abroad.
Crowd Emergencies, Mass Gatherings & Hospitals

Defined as, “Organized emergency health services provided for spectators and participants at events in which at least 1000 persons are gathered at a specific location for a defined period of time.”

Crowd Emergencies are Different

- The human response to disasters and emergencies is "phase-specific"
- The human response to disasters and emergencies is "hazard-specific"
- There will be disasters and emergencies in which the "behavioral footprint" will greatly outsize the physical or medical impact of the event
Understanding Human Behavior: *Lewin’s Equation*

Behavior is a Function of Person and Environment

\[ B = f (P, E) \]
Three Key Concepts

- Disasters can create crowds
- Crowds can create disasters
- Not all crowds are violent, but all crowds are potentially dangerous

Crowds at Hospitals: *The Circle of Life*

Crowds gather to see Prince William and Kate Middleton exit the Lindo Wing of St Mary’s Hospital in London with newborn Prince George on July 23, 2013.

On the 5th of June, 1968, crowds gathered at LA’s Good Samaritan Hospital. Senator Robert F. Kennedy was being treated there after being shot at the Ambassador Hotel.
Planned & Unplanned Events

**Planned**
- Major sporting events
- Air shows
- Rock concerts
- Festivals and celebrations
- Visits by dignitaries
- New product releases
- Strikes/Labor actions
- Political/Economic Events: (i.e., WTO, IMF, G8, G20, NATO summits, etc.)

All vary in their complexity and demand for medical services

**Unplanned**
- Unscheduled celebrity appearances
- Disasters
- Terrorism incidents
- Public health emergencies
- Demonstrations/Protests/Riots

A near-riot erupts spontaneously at Grauman's Chinese Theatre in LA following the rumor on Twitter of a free rap concert. July 2011.
Planning Assumptions

- NSSEs and other mass gatherings are potential targets for terrorists
- Visits by high-profile political figures or controversial activists, intensive security arrangements are necessary
- Multiple deaths and injuries at large public events have occurred consistently and over a wide spectrum of countries and types of events
- The hospital and EMS community's must be able to respond to the exceptional demands that the activity would place on response services
Crowd Emergencies: An Evolving Risk

- Global business leaders gathered at the World Economic Forum in Davos, Switzerland in early 2014 identified bloody protests, civil unrest and collective violence as the most significant risks facing governments and businesses for that year.

- At present, collective action is reshaping parts of Asia, the Middle East and Latin America, as well affecting communities across the U.S.
The Changing Landscape

Three Converging Trends

1. More people: 9 billion by 2045\(^1\)

2. More mobile communications: 5 billion mobile phone users by 2017\(^2\)

3. Greater perceived socio-economic disparity and social injustice

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Converging Trends

- These trends are converging in a way that changes the prevalence and scope of collective/crowd behavior.

- More people and greater access to instant mobile communications: phone, camera, video, web....
The Role of Social Media

- Promotion of a cause or action in social media validates participants
- Plays a role in organizing, communicating, coordinating
- Acts as an accelerant

Social media in crowd behavior and civil unrest is not causal, but can contribute to the rapid mobilization and movement of crowds and mobs. This concept is referred to as “hyper-accelerated social organization.”
Examples of Crowd Events

- Labor Actions/Protests
- Entertainment/Sporting Events
- Shopping
- Religious Events/Festivals
Case Study: Hajj 2015

September 2015:
1,100 people were killed and nearly 900 more injured in a stampede on the outskirts of Mecca, the deadliest tragedy to strike the annual hajj pilgrimage in more than two decades.

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Potential Group, Crowd and Mob Scenarios

- **Disasters**: Katrina, Haiti
- **Terrorism**: Tokyo sarin gas attack
- **Civil Unrest**: Arab Spring, Occupy protests, etc.
- **Mass Crime**: London Riots, Flash Mobs/Flash Robs, etc.

Panic in dense crowds can result in mass casualty scenarios.
Disaster-related Crowds

- **An Escape Mob**: is a mob in a state of panic. In their attempt to secure safety by flight, members of an escape mob may lose their power of reasoning.

- **An Acquisitive Mob** is motivated by a desire to acquire something perceived as valuable or critical such as food, water, or shelter.

- Both escape mob and acquisitive mobs are possible during large scale emergencies and disasters. This behavior is associated with panic response.

- **Remember**: *Crowds can create disasters*

August 31, 2005 - Baghdad:
At least 965 Iraqis were crushed to death or drowned in a stampede on a Baghdad bridge as vast crowds of Shiite pilgrims were sent into panic by rumors of suicide bombers in their midst.
Anticipating the Behavioral Response to Emergencies

Many emergency scenarios (i.e., CBRNE, disease outbreaks, etc.) are primarily behavioral emergencies.

**Example:** Sarin gas attack-Tokyo subway 3/95

Psychological Casualties : Medical Casualties

4:1


Public Health crises (i.e., SARS, pandemic influenza, etc.) also result in different responses that are not seen in natural or technological disasters. Those include:

- Mass Sociogenic Illness
- Panic
- **Surge in healthcare seeking behavior**
- Greater mistrust of public officials

These reactions further complicate and confuse the public health and medical response to the situation.

Sources of Danger

- There are well documented psychological and physical forces at work in large crowds that raise risks of harm
- Some crowds or mobs set out specifically to cause harm
Crowd Dynamics

Crowding, stampeding, trampling, and suffocating with no avenue of escape is the **number one cause** of multiple injuries and death by human hands in group settings.
Crowd Crush

- People need at least 1 square yard of space each to control their movements.
- As crowds become more dense, the compression increases exponentially.
- The compounded force of 5 people crushing in can kill a person.
- Humans lose consciousness after being compressed for just 30 seconds, they can be brain dead within 6 minutes.
- Most people who die in crowds die from asphyxiation while standing upright, not from trampling.
- Most die without ever falling down.
The Physics of Crowds

- Shock waves can move through a crowd with sufficient power to lift people off of their feet
- People can be lifted out of their shoes and have clothing torn
- Intense crowd pressures, exacerbated by anxiety, make it difficult to breathe
- The heat and thermal insulation of surrounding bodies cause some to be weakened and faint
- Access to those who fall may be impossible
The Physics of Crowds

One study showed that under a simulated "panic", 5 persons were capable of developing a vertical pressure of 766 lbs.

In one soccer stadium incident, people ended up piled on top of each other 10 feet deep, creating a horizontal pressure of 800-900 lbs.

_Horizontal Loading on Handrails. NBTC Tech. Rec 514, Nat.Tech. Centre, New South Wales._
Organized Protest Groups

The Direct Action Network (DAN) is “...a movement united in a common concern for justice, freedom, peace and sustainability of all life, and commitment to take direct action to realize radical visionary change”

“A small harm is acceptable to prevent a greater harm from occurring”

Central to several branches of anarchist philosophy is the idea that no social change is possible without violence
When Anarchists are Involved

Black Bloc Activists are not protesters. Their actions are designed to cause material damage.
What to Expect in a Riot or Violence Protest

- Anticipate the potential for looting and/or damage to medical facilities, vehicles, as well as drug stores.
- Expect injuries to both protestors* and law enforcement personnel.
- Plan for injuries and adverse reactions to Riot Control Agents (i.e., pepper spray (OC); tear gas (CS/CN)).

* Note: Anarchist groups bring “street medics” to care for their injured.

Closure of community-based clinics and healthcare providers, as well as pharmacies due to travel restrictions or damage will increase demand for hospital ED services.
General Medical Assumptions: 

From Horses to Zebras

- Generally, between 0.3 percent to 1.3 percent (Leonard, 2001) of event attendees will require some form of medical assistance, regardless of the character, locale, physical layout, and size of the event.
- Potential for mass casualty/mass trauma incidents
- Possibility of unusual diseases related to influx of international visitors (ex: malaria; polio; tuberculosis) with multi-national attendees
- Illnesses that may not recognize or that normally would be treated at other facilities
- Impact on out patient and community-based services that will be disrupted (dialysis, methadone clinic, etc.)
- Uptick in falls, sprains, and dehydration

Security Challenges

- Crowd control is essential to the handling of large special events and mass-casualty incidents (MCIs)
- Security is the task of the police at the site of the incident or event
- For a hospital, responsibility falls on its security forces, with the police assuming an auxiliary role
- Crowd control is complicated when the casualties are due to riots involving clashes between rioters and police.

In NSSE and other such events, extra credentialing and IDs for staff may be necessary to enter and travel within restricted areas.

Injuries are likely to police, protestors and bystanders alike.
Staff & Volunteers Needs

- Establishing a Human Services Center, including location and staffing
- Implementing emergency discharge procedures
- Establishing staff rest, nutrition, and sleeping areas, including location and staffing
- Establishing the labor pool, including location and staffing
- Registration and credentialing of volunteer staff

- Establishing staff psychological support and debriefing areas, including location and staffing
- Establishing a dependent care area, including location and staffing
- Identifying dependents
- Assessing materials and supply needs.
Logistics of Critical Supplies

Develop a written plan and procedures for procuring, handling, and distributing...

- Pharmaceuticals
- Medical supplies
- Food supplies
- Linen
- Water
- Critical Equipment
Example: Preparing for the Pope

The Pennsylvania Health System had three hospitals inside the restricted travel zone in Philadelphia during the Pope’s September 2015 visit. In planning for increased demand for services and decreased ability for staff travel, plans made and actions taken included:

- 2,000 staff members to sleep at its hospitals
- Installed 32 portable showers for staff
- Stocked up on 80,000 pounds of sheets, towels and blankets
- $1.25 million worth of extra medications, and 1,830 units of blood products
- Purchased 560 pounds of chicken fingers to help feed patients and staff
- Set up 225 translation phones for non-English speaking patients
- 100 babies were expected to be born at the Hospital of the University of Pennsylvania and Pennsylvania Hospital during the Papal events
Communications Logistics

Direct communications capabilities are needed with:

- All areas/departments within hospital
- Internal and external security personnel
- Other facilities
- External agencies

Alternative communications plans for all major communication systems are essential.

EMS staff in the field may have difficulty hearing even shoulder-mounted microphone/radio communications due to noise levels in a crowd.
Transportation Logistics

- Patients
- Staff
- Equipment to or from other facilities
- Staff to and from hospital during travel restrictions (planned or unplanned)
- Critical supplies

Blocking and closing critical roads and intersections is a common protest tactic that can be highly disruptive.
Communications

- Redundant communication systems are critical
- Field-based Emergency Responders:
  - Satellite phones
  - 2-way radios
  - Cell phones
  - Ham radios
- Nursing Staff
  - Regular phones/Smart Phones/other mobile devices
  - Phones at Nursing stations on patient units
Mass Notification

Crowd events and emergencies are extremely fluid. Rapid, targeted communication capabilities will be critical. Mass notification to clinicians and employees may be necessary to share information about:

- Changes in travel restrictions or routes
- Surge and demand on staffing levels
- A hazardous situation or condition that has developed
- Other emergency instructions

Consider that staff traveling by car or on foot may experience prolonged delays in going even short distances.

Mass notification to handheld devices (i.e., smartphones, SMS, email, etc.) will be necessary.
**On Call Communications**

Due to the fluid nature of crowd events and the difficulty in accurately forecasting actual crowd sizes, access to staff schedules and on-call availability is also important.

It may be necessary to:

- Increase staffing on very short notice
- Scale down staffing if expected crowds do not materialize
- Adjust staff arrival/departure times as events change
- Request specialized staffing in the event of different incident types
Recommendations

- Define process to communicate & coordinate with local, county, regional, state, & federal partners to enhance health care service delivery, security and business continuity before and during an event
- Designate and clarify the role of PIO & how they will work with Joint Information Center (JIC)
- Identify organizational Just-in-Time (JIT) training for medical personnel to support staff, credentialed & volunteer personnel, including crowd safety training
- Identify readily accessible & trained surge staff, equipment & supplies, & treatment space for all levels of care
- Have mass notification and on-call communications systems in place, test and ready for real-time crowd event
Closing Comments

- Consider that in some scenarios, behavioral (ex: fear) management will be as or more important than the physical implications of the crisis

- Build communications plans and messaging on accurate behavioral assumptions

- Plan and exercise in transparent ways that allow the community and workforce to see you learn and grow

- Stay informed about emerging behavioral research that can help you anticipate and respond more effectively to emergencies
Words to Live By

“The time to repair the roof is when the sun is shining”

-JFK
For More Information

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QUESTIONS?

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