



# **Mass Casualty Incidents Planning for the Conventional & Non-Conventional**



**Michael Stein MD, FACS,**  
Director of Trauma, Department of Surgery  
Rabin Medical Center, Beilinson Hospital  
Petach-Tikva, ISRAEL

**INJURY 2015 – Eden Park, Auckland, New Zealand  
August 6, 2015**

## Mass Casualty Incident

# The Rabin Medical Center Beilinson Hospital



### RMC

2000 – 2008

25 “limited” MCIs

10-50 patients each

### Nationwide – (Suicide Attacks)

1994 – 2010

160 “limited” MCIs

5-250 patients each

Involving All 27 Acute Care Hospitals  
in Israel

## Mass Casualty Incident

### Do we Have MCIs ?

#### Nationwide Mass Casualty Incidents

No Major Earthquakes in last 100 years

5 Full Scale Wars

Train MCI's – 3

3 Mass gathering trauma disasters





## Mass Casualty Incident

### A Few Basic Assumptions...

- **Study the Local History of Incidents**
- **Anticipate: Natural, Man-Made MCIs**
- **Types of Incidents:**
  - **Terror** – Conventional, Chemical, Biological, Toxicological
  - **Accidental** – Large Scale Transportation Accidents (Land, Air, Sea), Mass Gathering Accidents (Sport Stadiums, Musical Concerts)
  - **Natural** – Quakes, Floods, Fire etc.

## Mass Casualty Incident

### Experience from Leninakan (Armenia)

1988 – Earthquake

25,000 dead

40,000 injured

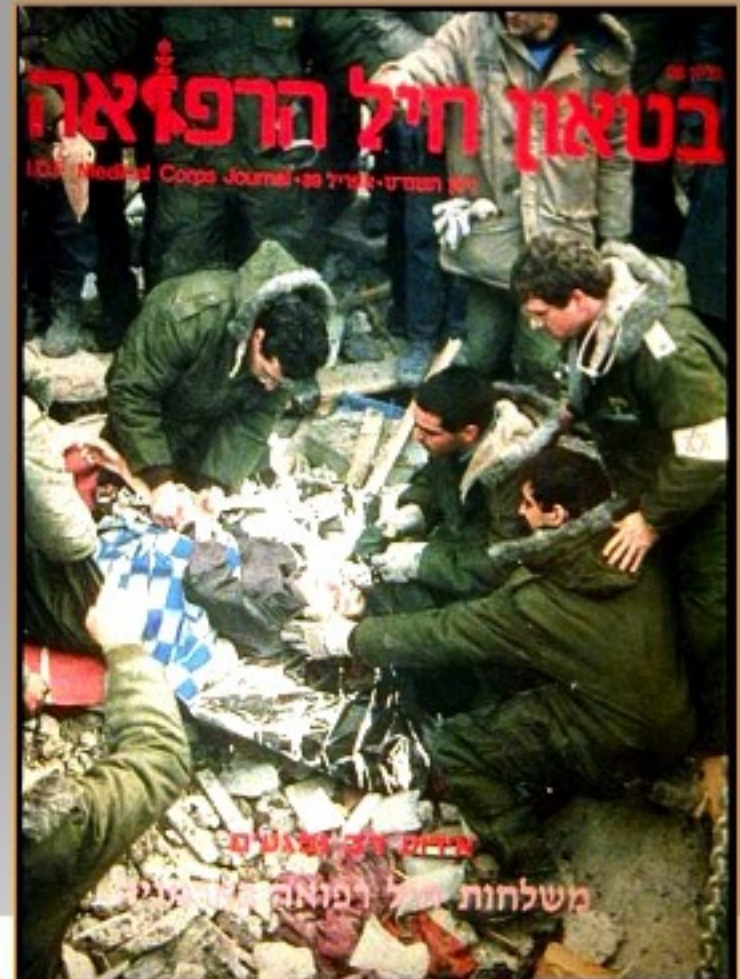
All 4 hospitals destroyed  
(one with whole staff)





## Mass Casualty Incident

### Leninakan (Armenia) 1988 – Earthquake



## Mass Casualty Incident

# At the Site of Disaster Adapazari, Turkey (1999)



> 200 Aftershocks – 5 significant – 4-5 On Richter's scale



## Mass Casualty Incident

# Earthquakes in Israel

## The Syrian-African Fault Along Jordan & Dead Sea Valleys

- Ramleh
- Safed
- Beit She'an
- Gaza
- Jaffa
- Jerusalem
- Hebron
- Nablus
- Jericho
- Tiberias

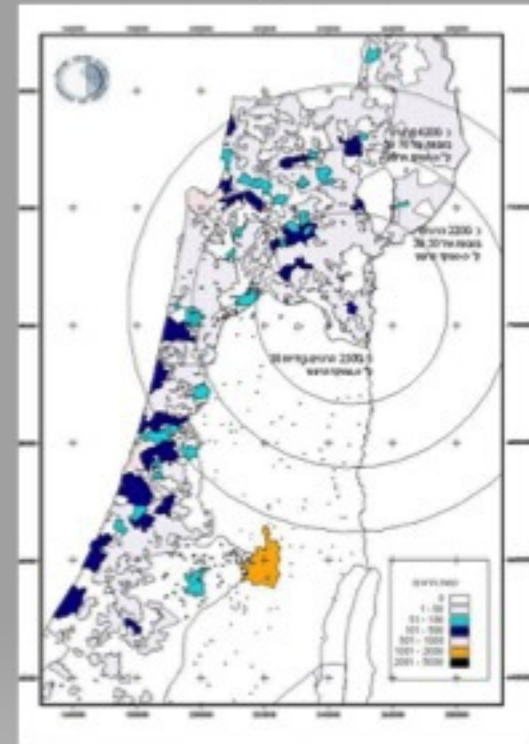
*Peleg, Reuveni, Stein – IMAJ 4;361-365, 2002*



## Mass Casualty Incident

# Beit She'an – The Jordan Valley

• <b>Dead</b>	<b>16,000</b>
• Severe Injury	6,000
• Mild Injury	83,000
• Displaced	377,000
• Buildings:	
• Collapsed	10,000
• Sev. Structural Damage	20,000
• Minor Damage	105,000



**Damage Estimates** (7.5–8.0 Richter's Scale)  
**Earthquakes in the Holy Land**

## Mass Casualty Incident

# Acute Care Hospitals in Israel

- ❑ "LEVEL 1" s **(6)** ~ 700 - 1500 beds
- ❑ "LEVEL 2" s **(14)** ~ 350 - 650 beds
- ❑ "LEVEL 3" s **(4±3)** ~ 150 - 300 beds

**Total Beds: 15,000**

**Expansion to 28,000 in Full scale war**

**Population (without West Bank & Gaza) → 7,500,000**

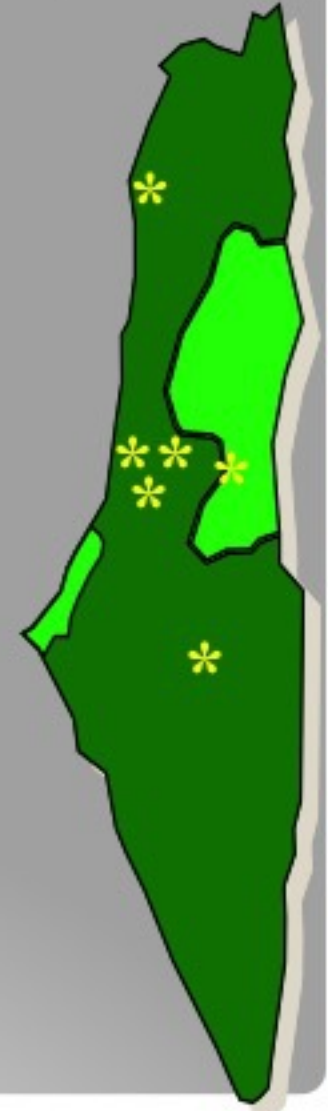


## Mass Casualty Incident

### "LEVEL I" Centers

- ☐ Haddassah
- ☐ Sheba
- ☒ **Rabin (Beilinson)**
- ☐ Ichilov (Sorasky)
- ☐ Soroka
- ☐ Rambam

Jerusalem  
Tel-Aviv (area)  
**Tel-Aviv (area)**  
Tel-Aviv  
Be'er-Sheva  
Haifa



## Mass Casualty Incident

# **Regional & Local Community, Municipal & Pre-Hospital Plan**

Purpose

Policy

**Definitions**

Organization Affected

Standard Operating Procedures

**Responsibilities** (Who is in Charge?)



## Mass Casualty Incident

# Pre-Hospital

### The Goal:

- To save the greatest possible number of patients from death
- To avoid as much as possible serious disability

### Achieved By:

- Prompt triage
- Appropriate treatment in Field (Less is More...)
- Rational prioritization of transportation to Appropriate designated facility

## Mass Casualty Incident

# Pre-Hospital

Procedures

**Communications**

**Transportation**

Deceased Persons

Triage Tape and Priority Selection Criteria

**START – Simple Triage & Rapid Transport**

Forms



## Mass Casualty Incident

# Hospital Preparedness Types of Terror Threats (and Non-Terror related Events)

- **Chemo**
- **Bio**
- **Radiation ??**
- **Conventional**



Textbook Protocols Are OK for Inspections !!

One Page Checklist is critical in a real Incident

## Mass Casualty Incident

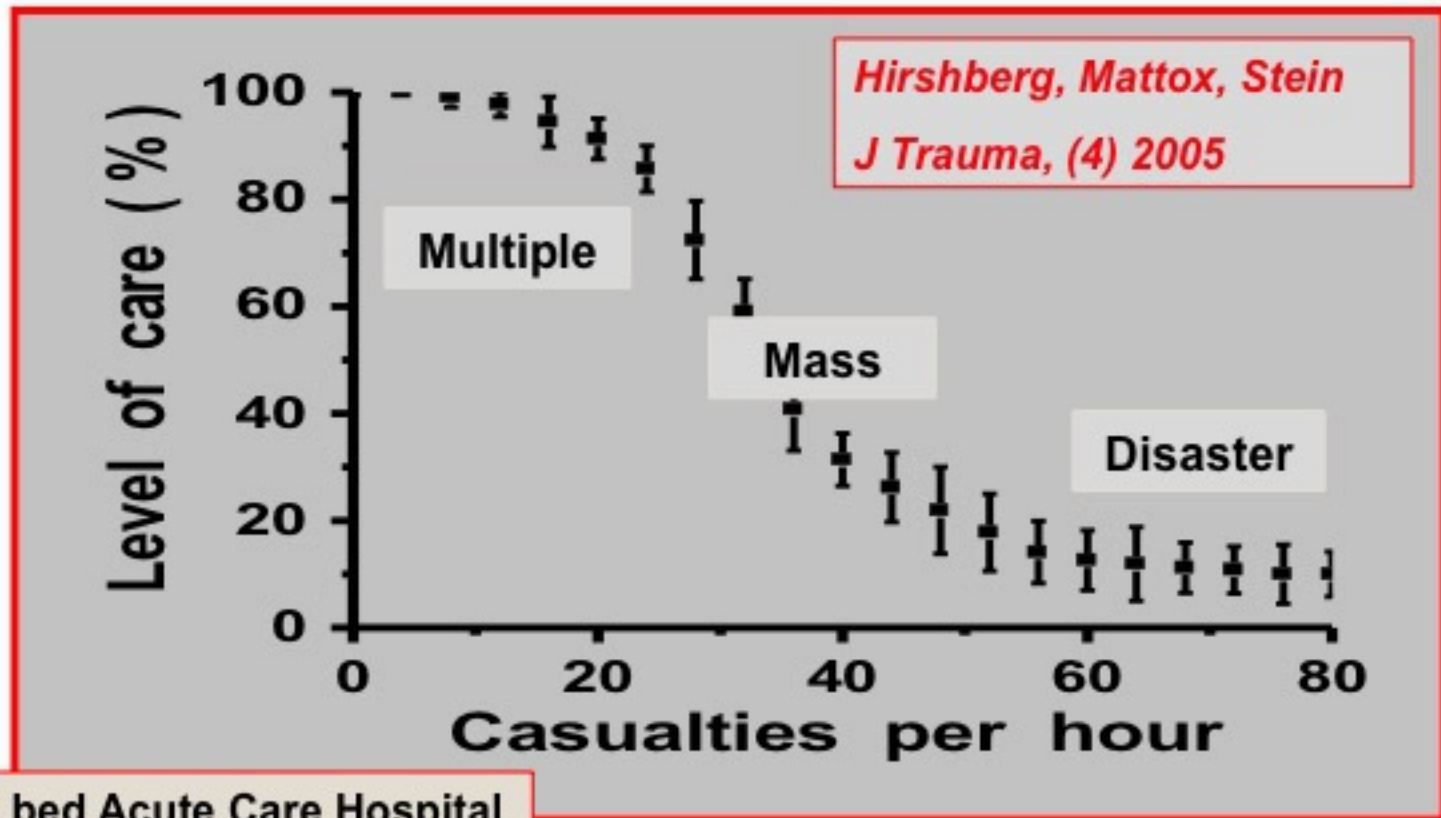
# When You Plan Your MCI Response

## More Basic Issues...

- Unless you are the only hospital in town...
- **Evacuation to Multiple Med. Facilities**
- EMS – Rational Primary Evacuation Plan
- **Prudent “2ry” Distribution**
- Make Sure You Have a “HEICS” – Hospital Emergency Incident Command System (5 Components)  
“Commander”, Planning, Logistics, Finances, Operations
- **Your HEICS Should be Integrated Within the Local Community Incident Command System:** Municipality, Police, Fire Department, EMS
- Have a Hospital Plan/Protocol For MCIs

## Mass Casualty Incident

What Scenario Should We Plan And Train For  
At The **Hospital** Level ?





## Mass Casualty Incident

### Conventional Threat

#### Concepts of Management for "Limited" MCI

##### Level "A":

	Critical	Non-Critical
▪ Large Hospital (Level I) – up to	→	4 / 10
▪ Small Hospital (Level II) – up to	→	2 / 5

##### Level "B":

▪ Large Hospital (Level I) up to Full Capacity of ED (40-60)	→	8 / 20
▪ Small Hospital (Level II) up to Full Capacity of ED (15-30)	→	4 / 10

#### Concepts of Management for "Large" MCI

- Hundreds of Victims
- More Than The Capacity of The ED
- Need For Deployment of Additional Treatment Sites

## Mass Casualty Incident

# Sequence of Events

- Alert the Staff (as per activation level)
- Evacuate the ED
- Open Treatment Sites Other Than The ED
  - HEICS command Ctr., Non-Urgent, ASR center, Info Center
- Mobilize Pre-arranged Equipment Stockpiles
- Medical – Switch to “Mass Casualty” Tmt. Mode



## Mass Casualty Incident

# Medical Care

### Initial Phase - Modified Guidelines

MAXIMAL Care for Unstable Salvageable (**Except in Futile Cases**)

“MINIMAL ACCEPTABLE CARE” for Serious Non-Urgent

NO CARE for Mild Non-Urgent

### Secondary Phase – Completion to Optimal Care

DEFINITIVE Care – X-Ray, Operations

“Delayed” Optimal Care

2ry Distribution – Only AFTER ALL Victims Arrive

### Late Phase

Prepare for the Next Incident

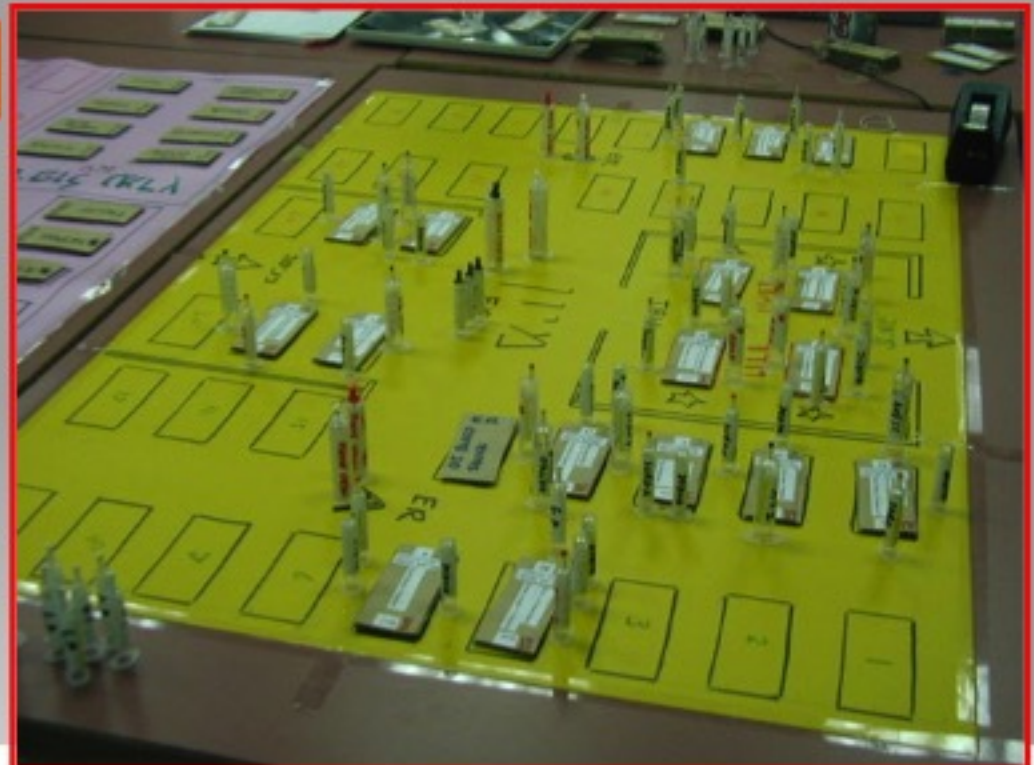


## Mass Casualty Incident

# Exercise, Exercise, Exercise...

## *Hospital Preparedness*

### Table-Top Exercises



## Mass Casualty Incident

# Exercise, Exercise, Exercise...

## *Hospital Preparedness*



**Large Scale Live Exercises**

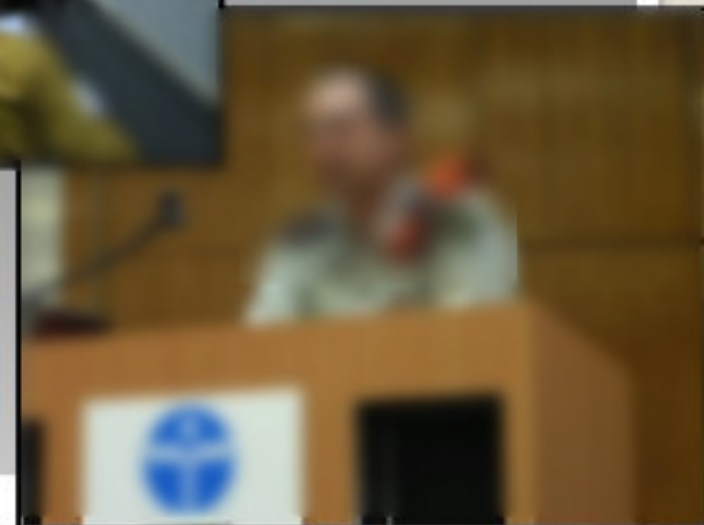
## Mass Casualty Incident

# Exercise, Exercise, Exercise...

## *Hospital Preparedness*



**Post Drill / Real Incident Debriefing**





## Mass Casualty Incident

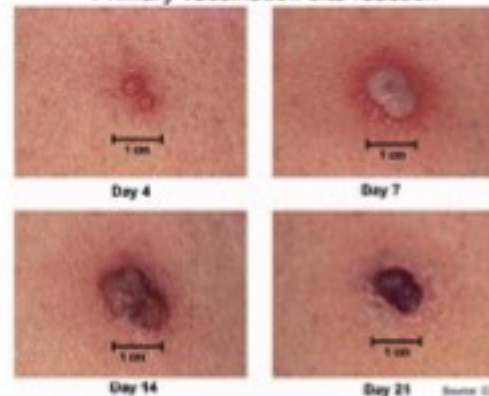
# The Biological Threat

- ❑ *Anthrax*
- ❑ *Small Pox*
- ❑ *Others (?)*

Community Preparedness  
Year & Months in Advance



Primary vaccination site reaction

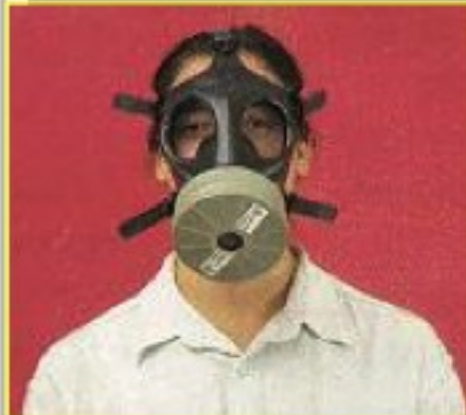


**15,000 Health Care Personnel Immunized**

## Mass Casualty Incident

# The Chemo Threat

## *Home Preparedness*



Automatic Injectors:

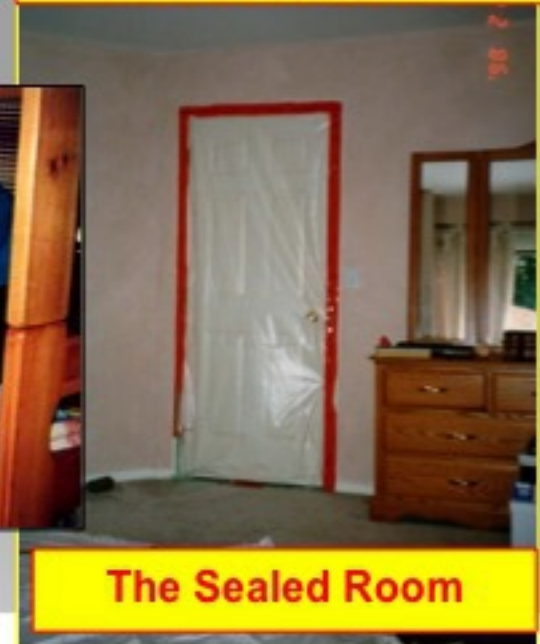


Atropine ± Toxogonin

**February 2003**



**January 1991**



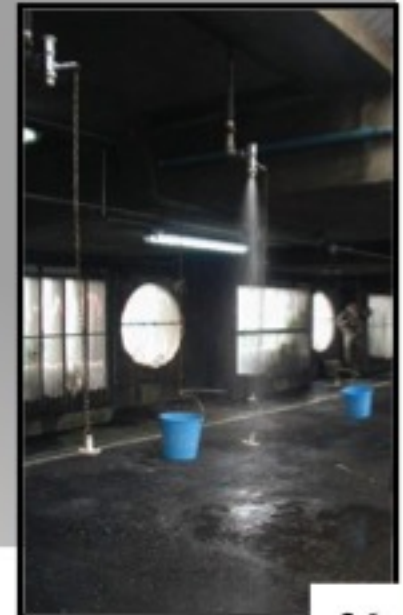
**The Sealed Room**



## Mass Casualty Incident

# Chemo Threat - Triage Classification

- |                                     |   |                 |
|-------------------------------------|---|-----------------|
| • <b>Walking</b>                    | → | <b>Mild</b>     |
| • <b>Lying Down – Breathing</b>     | → | <b>Moderate</b> |
| • <b>Lying Down – Not Breathing</b> | → | <b>Severe</b>   |





## Mass Casualty Incident

# Concept of Decontamination

- ❑ Field De-contamination (at site)



Vs



- ❑ Hospital (designated site) De-contamination

## Mass Casualty Incident

# Chemo Threat Hospital Preparedness



**Hospitalization  
Severe & Moderate**

**Secured Facility**

**Decon.  
Showers**

**Mild - Out**

**Rabin Medical Center**

**ED**



## Mass Casualty Incident

# Chemo Threat

Hospital Preparedness  
Additional Equipment



Decon. Site - Cart



Special "Active" Gas Masks  
with blower



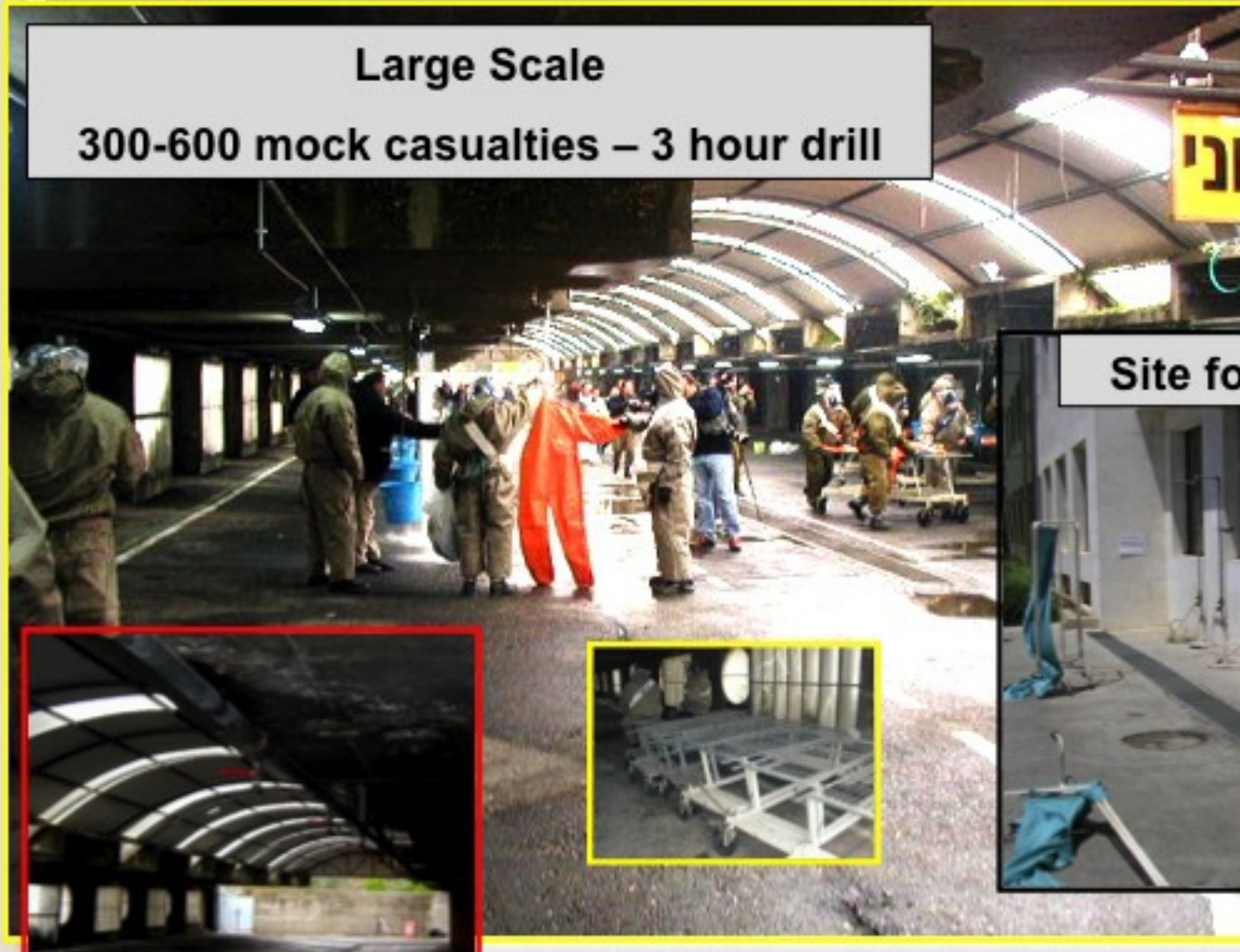
## Mass Casualty Incident

# Chemo Threat

## Hospital Preparedness

Large Scale

300-600 mock casualties – 3 hour drill



Site for Limited Incident



## Mass Casualty Incident

Radiological Accident (not Bomb !!)

5 Designated Hospitals

Decon. as for Chemo

## Hospital Preparedness

Floor Covered With  
polyethylene sheets





## Mass Casualty Incident

# Nuclear Bomb

Hospital Preparedness ??

Medical System Preparedness??

- ☐ Basically Prevention
- ☐ Same as Nuclear Accident
  - & “Dirty” Bomb (probably ineffective)
    - ☐ But, on a different scale
- ☐ Intelligence & Technology is the answer !!!
  - ☐ “Hetz 2 & 3” – (Arrow 2 & Arrow 3)
  - ☐ The “Iron Dome” System



**“Iron Dome”**



**“Iron Dome”**



**“The Hetz System”**



## Mass Casualty Incident

# Summary – 1

- ☐ Have Regional MCI plan
- ☐ Have Local MCI plan
- ☐ Have a Hospital MCI Plan
- ☐ Pre-Designate Additional Treatment Sites
- ☐ Prepare for Possible Decon. Need
- ☐ Have Basic Stockpiles of Equipment
- ☐ Educate the Staff

## Mass Casualty Incident

# Summary – 2

- ❑ **GOAL – Best Outcome for INCIDENT**
  1. **Minimize Mortality As Much As Possible**
  2. **Minimize Morbidity As Much As Possible**
- ❑ **Switch to “*Minimal Acceptable Care*” Mode Vs Optimal Care Guidelines**
- ❑ **Perform Exercises and Implement Lessons Learned**



RABIN MEDICAL CENTER  
BEILINSON HOSPITAL

# Thank You

**Michael Stein MD, FACS,**

Director of Trauma

Department of Surgery

Rabin Medical Center, Beilinson Hospital

Petach-Tikva, ISRAEL

[mshtein@clalit.org.il](mailto:mshtein@clalit.org.il)

**INJURY 2015 – Eden Park, Auckland, New Zealand  
August 6, 2015**