

Radiology MCI PLAN DEVELOPMENT

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**NO
FINANCIAL
DISCLOSURES**

*If you're, like me, the Department
MCI/DMP/Response Director...*



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Key Points

- ***Integrate with Hospital System***
 - Work with the hospital Emergency Manager
 - Understand ICS
- ***Know your Capabilities***
 - Determine triggers for activation
 - surge capacity
 - Determine your bottlenecks
- ***Plan for ALL Reasonable Contingencies***
 - Stick to SOP where possible
 - Run a HVA to determine likely scenarios and HOPE to operate within those constraints
 - Assess Communication strengths and weaknesses
- ***Drill and Exercise***
 - Tabletop
 - Simulations
 - Adjust plan accordingly

Don't be a "one man show"



Don't be a "one man show"



Minimum Planners

Director

Assistant Director

Key Stakeholders



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Integrate with Hospital System

- Work with the hospital Emergency Manager

Integrate with Hospital System

- Work with the hospital Emergency Manager
 - Vested Interest

Integrate with Hospital System

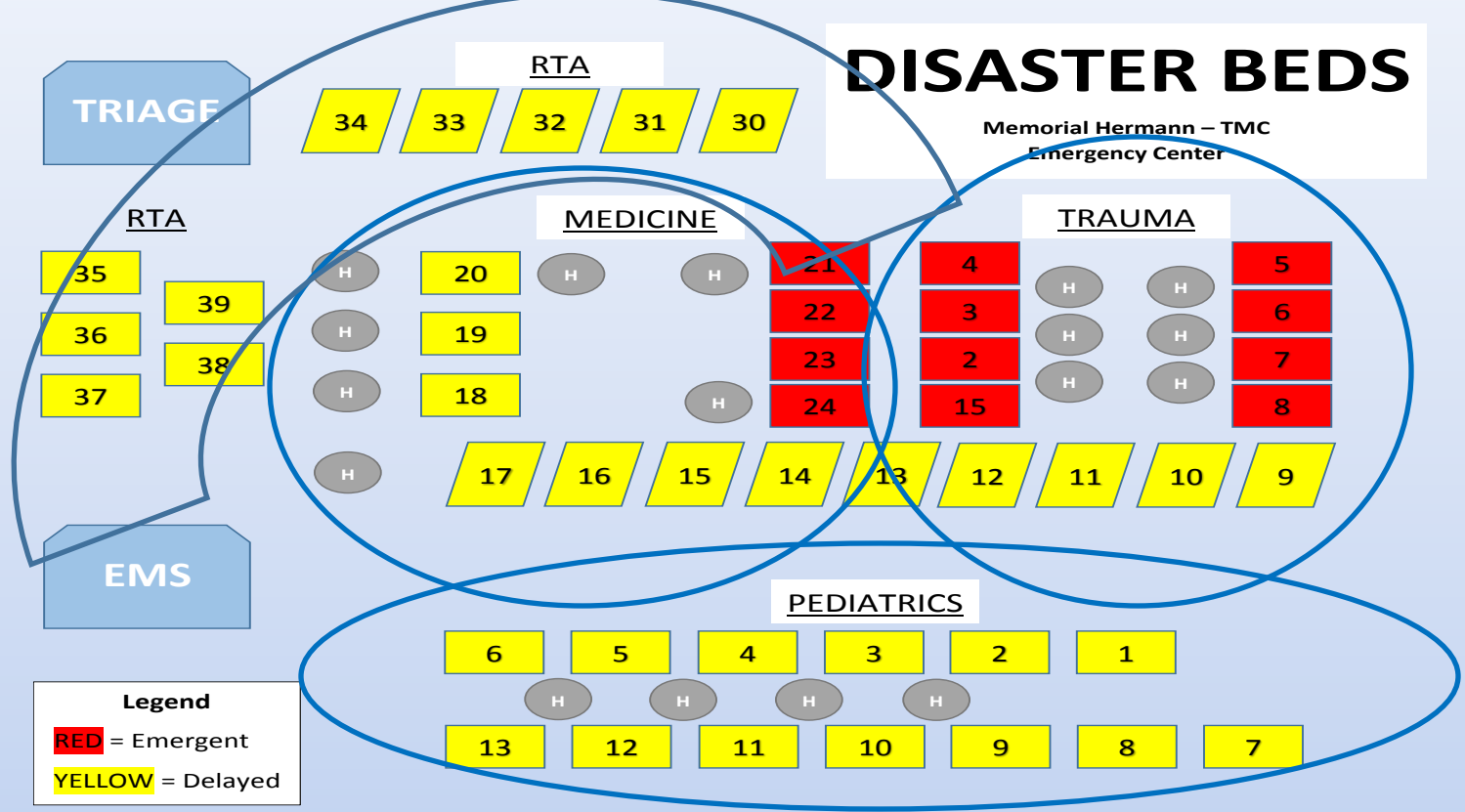
- Work with the hospital Emergency Manager
 - Vested Interest
 - Well Positioned for Success

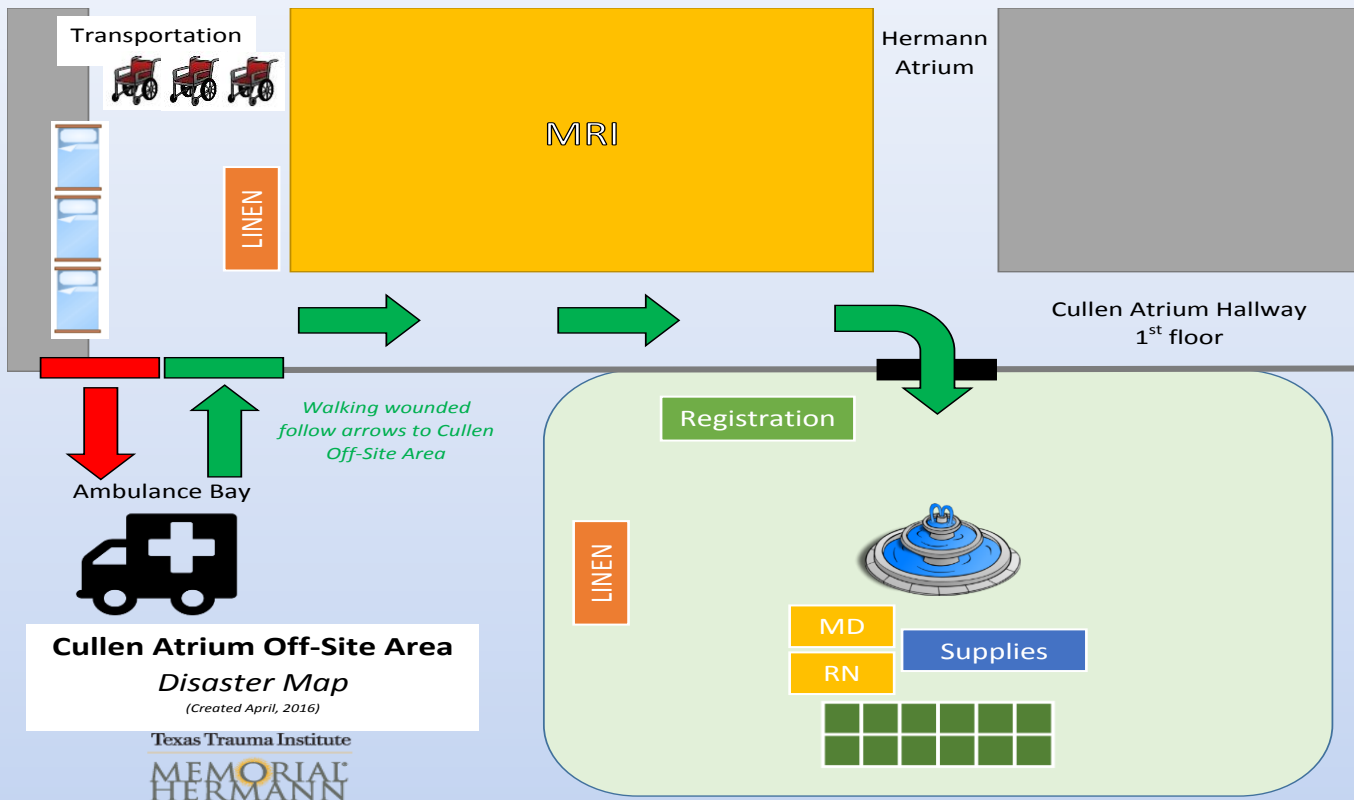
Integrate with Hospital System

- Work with the hospital Emergency Manager
 - Vested Interest
 - Well Positioned for Success
 - Knowledgeable

DISASTER BEDS

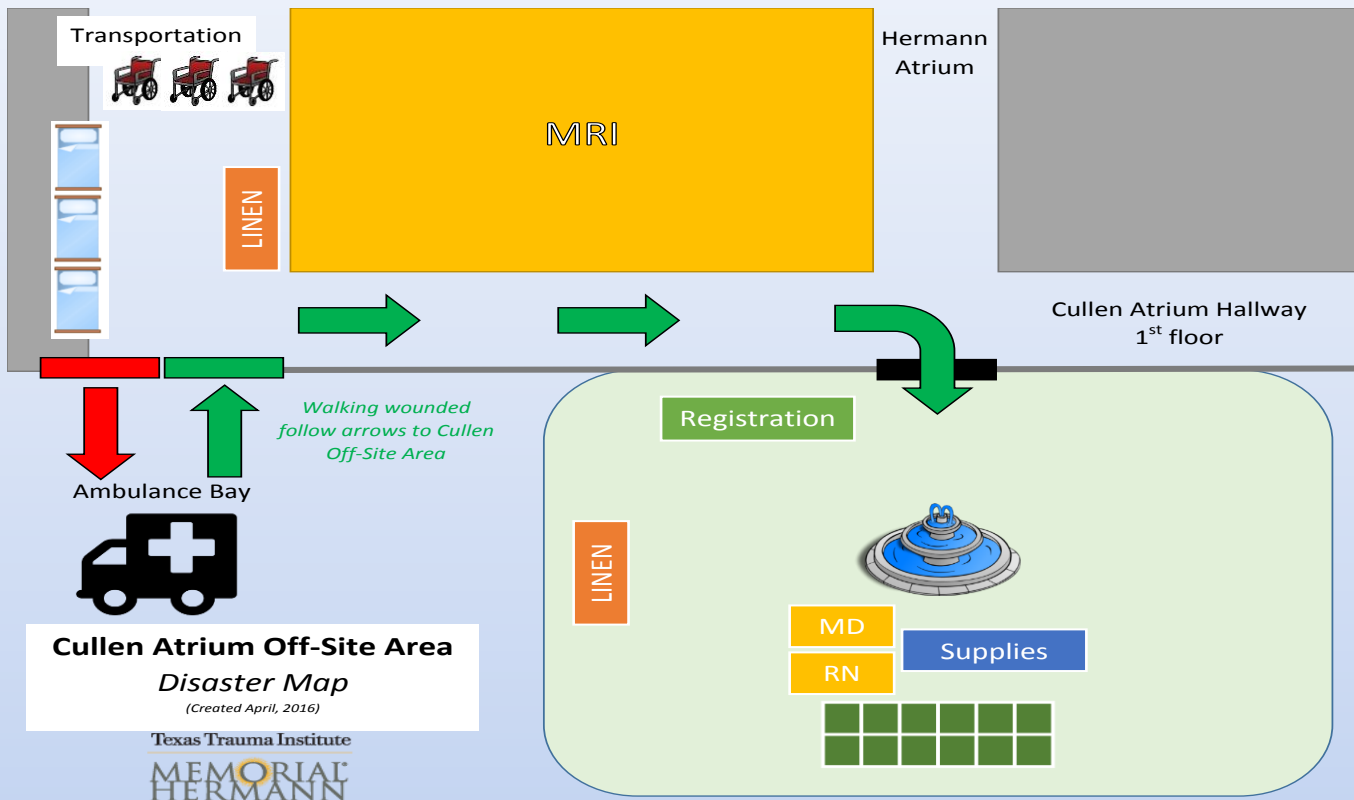
Memorial Hermann – TMC
Emergency Center





Cullen Atrium Off-Site Area
Disaster Map
 (Created April, 2016)

Texas Trauma Institute
 MEMORIAL
 HERMANN



**RADIOLOGIST
HERE!**
*(reading off
portable unit,
if necessary)*

**Cullen Atrium Off-Site Area
Disaster Map**
(Created April, 2016)

Texas Trauma Institute
MEMORIAL
HERMANN

Integrate with Hospital System

- Work with the hospital Emergency Manager
- Meet with Trauma Surgery
- Meet with Emergency Medicine



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Integrate with Hospital System

- Work with the hospital Emergency Manager
- Understand ICS



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Integrate with Hospital System

- Work with the hospital Emergency Manager
- Understand ICS

Incident Command System



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Integrate with Hospital System

- Work with the hospital Emergency Manager
- Understand ICS
 - Allows individual functional units to work together effectively

Integrate with Hospital System

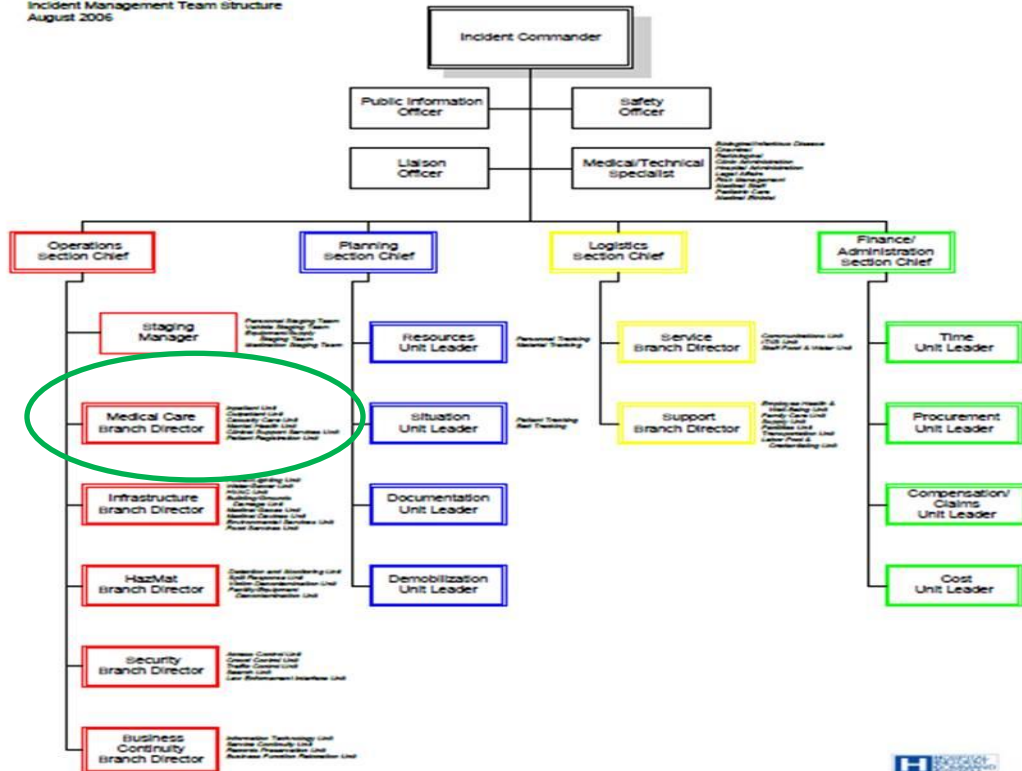
- Work with the hospital Emergency Manager
- Understand ICS
 - Allows individual functional units to work together effectively
 - Provides mechanism to share resources

Integrate with Hospital System

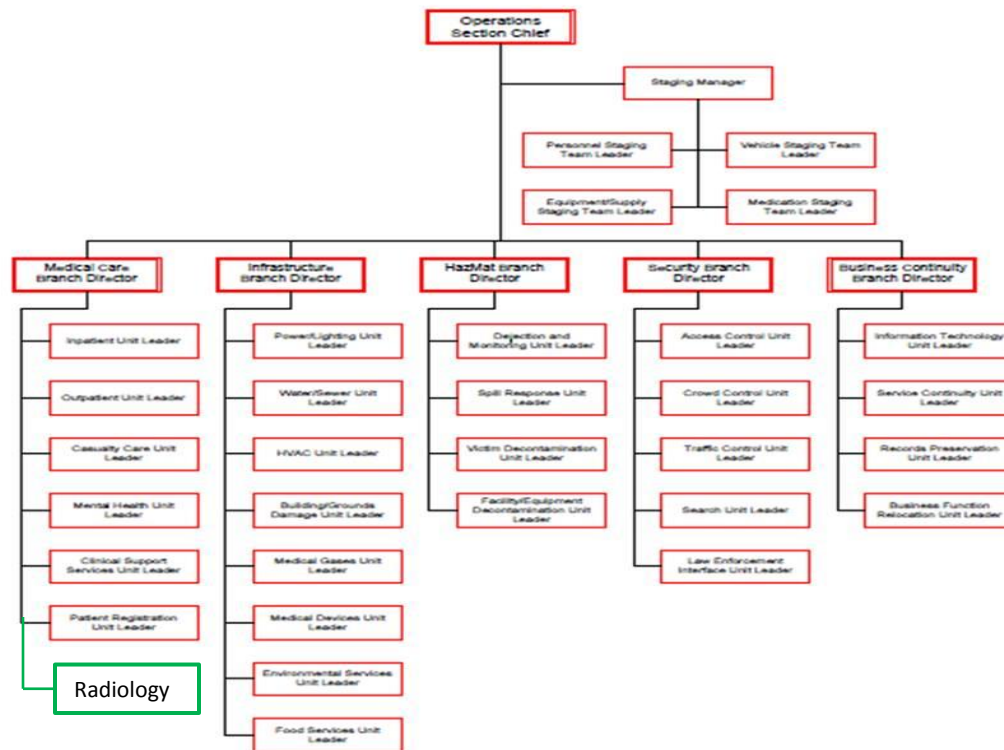
- Work with the hospital Emergency Manager
- Understand ICS
 - Allows individual functional units to work together effectively
 - Provides mechanism to share resources
 - Modularly expandable and collapsible

HICS Incident Management Team Chart

Hospital Incident Command System
Incident Management Team Structure
August 2006



HICS Incident Management Team: Operations Section



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Radiologist Physician Response - WHO

- **All Emergency Radiologists**
- **Interventional Radiologists**
- **other radiology faculty**
 - Body Imaging
 - **Neuro**
 - Chest
 - **Pedi**
 - Anyone else who wants to help – labor pool
- **Residents** onsite or on call
- Chief Residents

Radiologist Physician Response - HOW

- Paging System
- Telephone Tree

Radiologist Physician Response - HOW

- Paging System
- Telephone Tree
- Electronic Alerting System
 - such as Everbridge



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Radiologist Physician Response - **WHAT**

- When and Where to show up
 - Can be built into alert system



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Radiologist Physician Response - WHAT

- When to show up
 - Can be built into alert system
 - Need to begin planning for relief

Radiologist Physician Response - **WHAT**

- How they're going to get there
 - Road Access
 - Road Closures



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Radiologist Physician Response - WHAT

- How they're going to get there
 - Road Access
 - Road Closures
 - Hospital Access



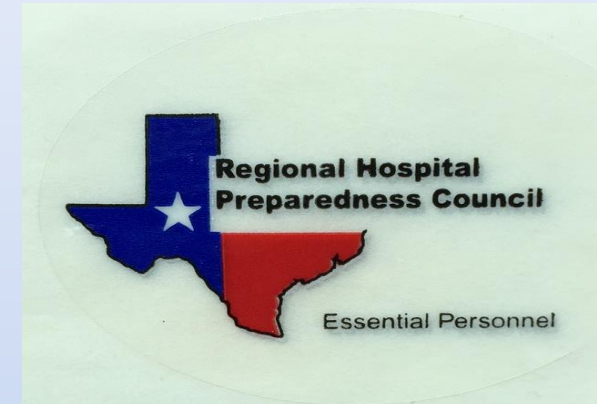
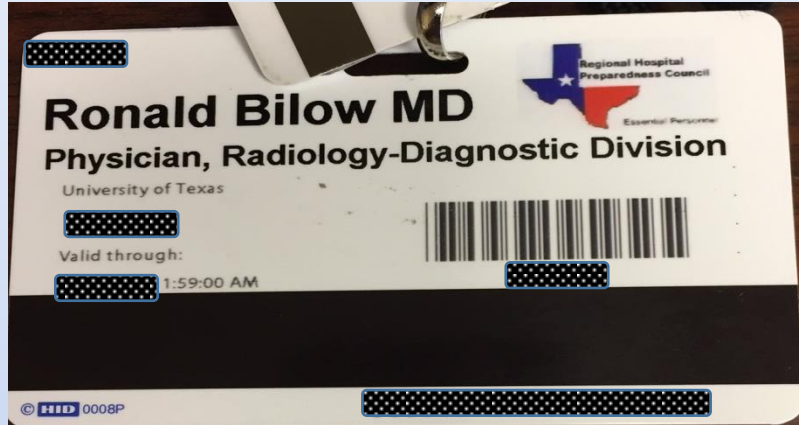
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Road, Gas, Hospital Access



Radiologist Physician Response - **WHAT**

- Where to Report
 - Staging Area

Radiologist Physician Response - WHAT

- Where to Report
 - Staging Area
 - Labor Pool
 - Timekeeping management

Radiologist Physician Response - WHAT

- Where to Report
 - Staging Area
 - Labor Pool
 - Reading Area



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SOP

Standard Operating Procedures

MUST PLAN for **ALL** Contingencies

- No power → No imaging

You're done!

Plan for ALL Contingencies

- Stick to SOP where possible



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ASSUMPTIONS

- Imaging Services are Operational
- ALL Imaging Equipment power is supplied by system supported with backup generator



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ASSUMPTIONS

- Imaging Services are Operational
- **ALL** Imaging Equipment power is supplied by system supported with backup generator
 - Imaging Machines/Devices
 - PACS Servers and Workstations
 - ALL Integrated Program Servers
 - EMR
 - Reporting Tools
 - Internal Communications/Tracking (eg, Primordial)



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ASSUMPTIONS

- Imaging Services are Operational
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 - Reporting Tools
 - Internal Communications/Tracking (eg, Primordial)

VERIFY with PACS Support and/or Emergency Manager

Plan for ALL Contingencies

- Stick to SOP where possible
- Plan for Everything

Plan for ALL Contingencies

- Stick to SOP where possible
- Plan for Everything...**REASONABLE**

Plan for ALL Contingencies

- Stick to SOP where possible
- Plan for Everything...**REASONABLE**
- Run an HVA (hazard vulnerability analysis)



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Hazard Vulnerability Analysis

- Considers Likelihood and Impact of Potential Threats
- Used to Formulate Plan of Action – should these occur



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HAZARD AND VULNERABILITY ASSESSMENT TOOL HUMAN RELATED EVENTS



EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
	Likelihood this will occur	HUMAN IMPACT <i>Possibility of death or injury</i>	PROPERTY IMPACT <i>Physical losses and damages</i>	BUSINESS IMPACT <i>Interruption of services</i>	PREPAREDNESS <i>Preplanning</i>	INTERNAL RESPONSE <i>Time, effectiveness, resources</i>	EXTERNAL RESPONSE <i>Community/Mutual Aid staff and supplies</i>	
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
Mass Casualty Incident (trauma)								0%
Mass Casualty Incident (medical/infectious)								0%
Terrorism, Biological								0%
VIP Situation								0%
Infant Abduction								0%
Hostage Situation								0%
Civil Disturbance								0%
Labor Action								0%
Forensic Admission								0%
Bomb Threat								0%
AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

*Threat increases with percentage.

RISK = PROBABILITY * SEVERITY
0.00 0.00 0.00

Relative Risk =

$$\left[\frac{\text{Probability of Event Occurrence (0-3)}}{3} \right]$$

*

$$\left[\frac{\begin{array}{l} \text{Human Impact (1-3)} \\ + \\ \text{Property Impact (1-3)} \\ + \\ \text{Business Impact (1-3)} \end{array} + \frac{\begin{array}{l} \text{Preparedness (1-3)} \\ + \\ \text{Internal Response (1-3)} \\ + \\ \text{External Response (1-3)} \end{array}}{18} \right]$$

HAZARD AND VULNERABILITY ASSESSMENT TOOL HUMAN RELATED EVENTS



EVENT	PROBABILITY <small>Likelihood this will occur</small>	SEVERITY = (MAGNITUDE - MITIGATION)						RISK <small>Relative threat*</small>
		HUMAN IMPACT <small>Possibility of death or injury</small>	PROPERTY IMPACT <small>Physical losses and damages</small>	BUSINESS IMPACT <small>Interruption of services</small>	PREPAREDNESS <small>Preplanning</small>	INTERNAL RESPONSE <small>Time, resources, resources</small>	EXTERNAL RESPONSE <small>Community/Mutual Aid staff and supplies</small>	
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
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AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

*Threat increases with percentage.

RISK = PROBABILITY * SEVERITY
0.00 0.00 0.00

Relative Risk =
$$\frac{\text{Probability of Event Occurrence (0-3)}}{3} * \left(\frac{\text{Human Impact (1-3)} + \text{Property Impact (1-3)} + \text{Business Impact (1-3)}}{3} + \frac{\text{Preparedness (1-3)} + \text{Internal Response (1-3)} + \text{External Response (1-3)}}{3} \right)$$

Know Your Capabilities

- Determine triggers for activation
 - How many patients can you image per hour?
 - How many exams can you read per hour?



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Drill and Exercise

- Test individual functions
- Tabletop exercises
- Simulations



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Drill and Exercise

- Test individual functions
- Tabletop exercises
- Simulations
- Adapt plan based on performance



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Functional Operations

- Resources
 - Manpower
 - Equipment
 - Communications



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Functional Operations

- Resources
 - Manpower
 - Technologists
 - Clerks
 - Transporters
 - Readers (attending, fellow and resident radiologists)

Functional Operations

- Resources
 - Manpower
 - Equipment – Image Acquisition
 - XR
 - CT
 - US
 - IR Suites

Functional Operations

- Resources
 - Equipment – Image Acquisition
 - XR
 - CT
 - Routine protocol
 - Modified MCI protocol
 - IV or no IV contrast
 - **PRELOAD on ALL potential SCANNERS**



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Functional Operations

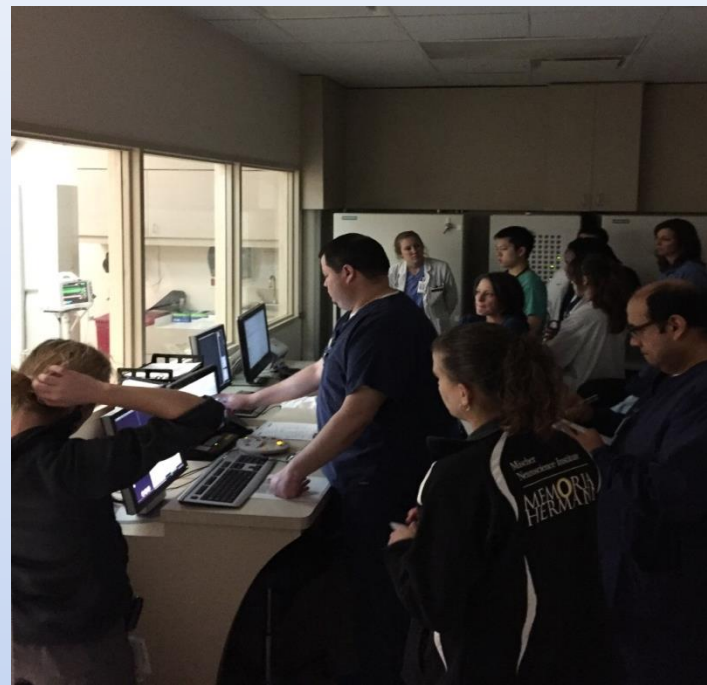
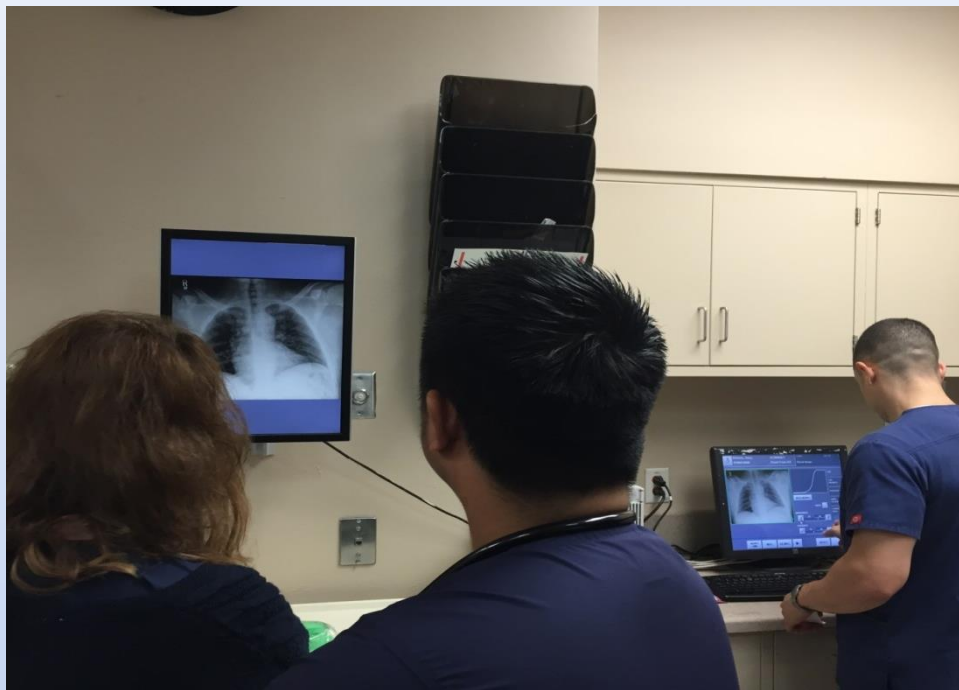
- Resources
 - Equipment – Image Interpretation
 - PACS Workstations



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Functional Operations

- Resources
 - Equipment – Image Interpretation
 - PACS Workstations
 - Onsite/offsite
 - Network/connectivity issues
 - Communication issues

Functional Operations

- Resources
 - Equipment – Image Interpretation
 - PACS Workstations
 - Reporting
 - Electronic
 - Paper
 - Communication?
 - Runners?



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Functional Operations

- Resources
 - Equipment – Image Interpretation
 - PACS Workstations
 - Reporting
 - Preliminary
 - Checklists?
 - Diagnoses only?
 - Final

				Comments
Head Face Neck	Epidural	No / R / L		
	Subdural	/ Bilat		
	Subarachnoid	No / R / L		
	Parenchymal	/ Bilat		
	Hemiatom	No / R / L		
	Pneumocephalus	/ Bilat		
	Bullets/Strapnel	No / R / L		
	Skull Fracture	/ Bilat		
	Face Fracture	No / Y /		
	Globe Rupture	Impending		
	Intraconal injury	No / Y		
	H&N Vascular injury	No / Y		
	Location >>>	No / R / L		
/ Bilat	No / R / L			
/ Bilat	No / R / L			
/ Bilat	No / R / L			
/ Bilat	No / R / L			
/ Bilat	No / Y			
Chest	Pneumothorax	No / R / L		
	Pneumodiatrum	/ Bilat		
	Hemothorax/Effusion	No / Y		
	Rib Fractures	No / R / L		
	Segmental	/ Bilat		
	Aortic injury	No / R / L		
	Cardiac injury	/ Bilat		
	Diaphragm Rupture	No / R / L / Bilat		
	Torso Bullets/Strapnel	No / Y		
	Liver	Type: No / Y /		
	Spleen	No / Y /		
	Kidney	Pericardial Fluid		
	Pancreas	No / R / L		
Bowel/Mesentery	No / Y Location(s) >>			
Hemoperitoneum	No / Y			
Ascites	Grade: No / Y			
Free Air	Grade: No / Y			
Pelvis	Bladder Rupture	Grade: No / R / L		
	Fractures	/ Bilat		
	Hematoma	No / Y		
Vascular Injury:	Extravasation	No / Y		
	Site: _____	No / Y		
Spine	Fracture/disruption: C / T / L	Sm / Lg	No / Y	
	Location >>>>	No / Y		
		No / Y		
		No / Y		
		Intraper / Extraper	No / Y	
		Type: No / Y		
		No / Y		
		No / R / L		
		Bilat	No / R / L	
		No / Levels		

Functional Operations

- Resources
 - Equipment – Image Interpretation
 - PACS Workstations
 - Reporting
 - Detail





Recovery

- Responder Relief
- Responder Compensation
- Continuation of Normal Operations
 - “Continuity Planning”
- Don’t forget about current hospital census



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Post Event

- Debrief meeting ASAP (After Action)
 - Determine what worked well
 - Determine what did not work well
 - Formulate plan to improve performance in future
- Critical Incident Stress Debriefing - UT EAP (Employee Assistance Program)

$x + y + z = ???$

$X + Y + Z = ???$

$X + y + z = ???$

$X + Y + Z = ???$

$x + y + z = ???$

$x + y + z = ???$

$x + y + z = ???$

$x + y + z = ???$

$x + y + z = ???$

$x + y + z = ???$

$X + Y + Z = ???$

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$X + Y + Z = ???$

$x + y + z = ???$

$x + y + z = ???$

To Summarize...

Work within the system

To Summarize...

Work within the system

Know your capabilities and limitations



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To Summarize...

Work within the system

Know your capabilities and limitations

Anticipate scenarios



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To Summarize...

Work within the system

Know your capabilities and limitations

Anticipate scenarios

Practice, practice, practice...and adapt



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THANK YOU VERY MUCH



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