

# **A SYSTEMS APPROACH TO MITIGATING DISASTER LOSS**

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# A SYSTEMS APPROACH TO LOSSES

## Goal:

- Describe an integrated urban trauma system approach to mitigating disaster and multiple casualty incident losses



# SYSTEMS APPROACH TO LOSS

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- Describe an integrated urban trauma system approach to mitigating disaster and multiple casualty incident losses
- Use a case report of an urban multiple casualty incident to illustrate the system



# SYSTEMS APPROACH TO LOSS

- Seattle, Washington USA
  - 3.8 million people in the region
  - Hospitals are classified by trauma capability
    - Levels I (highest) to Level 5 (lowest)
    - Harborview Medical Center
      - Level 1 for State of Washington
      - Disaster Medical Control Center for State of Washington



# SYSTEMS APPROACH TO LOSS

- Emergency medical services (pre-hospital)
  - Publically funded
  - Integrated within fire department
  - High level advanced life support capabilities





# SYSTEMS APPROACH TO LOSS





# SYSTEMS APPROACH TO LOSS



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# SYSTEMS APPROACH TO LOSS





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# SYSTEMS APPROACH TO LOSS



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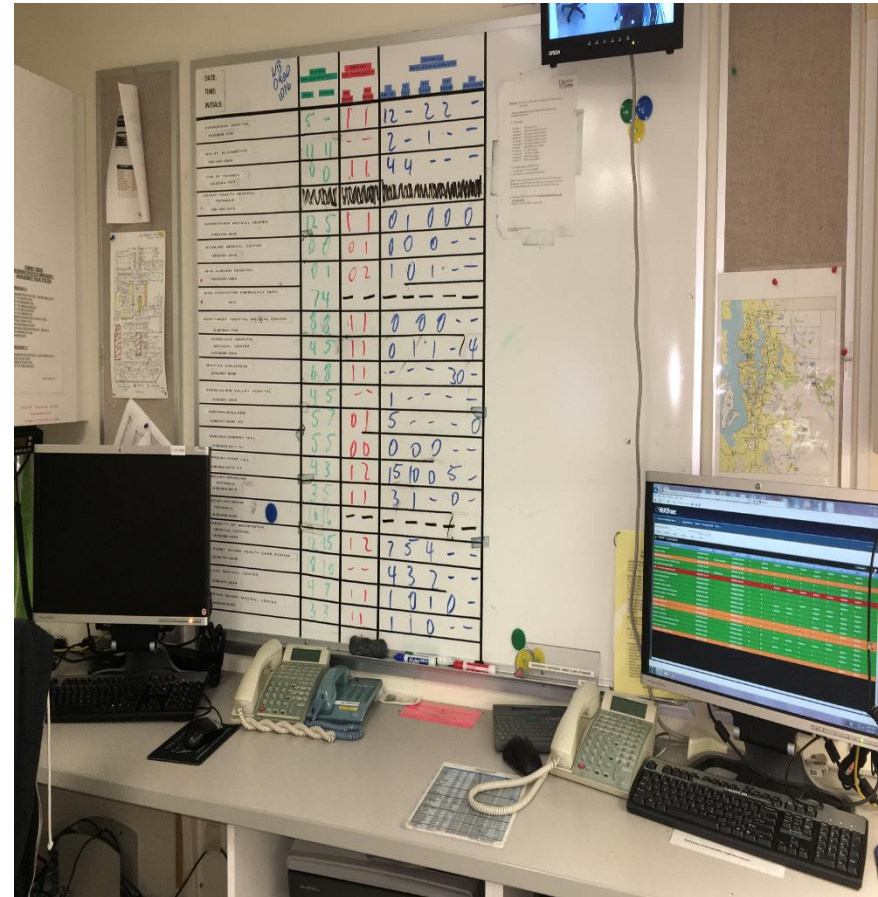
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# SYSTEMS APPROACH TO LOSS

- First call @11:12
- Notification to ED Charge by EMS @11:15
- Small Meeting of ED Leaders
  - ED Charge
  - ED Attending/Consultant
  - ED Leadership
- Activation of Disaster Medical Control Center
  - Patient Distribution
- Activation of Hospital Disaster Plan



# DISASTER MEDICAL CONTROL CENTER



	Time	Color			Number	Age	Sex	Intubated?	Injuries	Destination		
1	11:55	RED	Y <del>EL</del> W	GRN	1	65	M	F	YES	NO	Abd Pain	CH - KID
2		RED	Y <del>EL</del> W	GRN	2		M	F	YES	NO		FH
3		RED	Y <del>EL</del> W	GRN	3		M	F	YES	NO		UW
4		RED	Y <del>EL</del> W	GRN	4		M	F	YES	NO	Large tension Δ to HMC	CH - M31
5		RED	Y <del>EL</del> W	GRN	5		M	F	YES	NO		VM - 4
6		RED	Y <del>EL</del> W	GRN	6	35	M	F	YES	NO	2/4	HMC NPI
7		RED	Y <del>EL</del> W	GRN	7		M	F	YES	NO		CH -
8	11:57	RED	Y <del>EL</del> W	GRN	8		M	F	YES	NO		FH
9		RED	Y <del>EL</del> W	GRN	9		M	F	YES	NO		UW
10	12:01	RED	Y <del>EL</del> W	GRN	10	46	M	F	YES	NO	Pt x	FH
11		RED	Y <del>EL</del> W	GRN	11		M	F	YES	NO	Facial lac	FH
12		RED	Y <del>EL</del> W	GRN	12	71	M	F	YES	NO	Syncope	VM
13		RED	Y <del>EL</del> W	GRN	13	71	M	F	YES	NO		VM
14	12:05	RED	Y <del>EL</del> W	GRN	14	20	M	F	YES	NO	Pelvic	HMC NPI
15		RED	Y <del>EL</del> W	GRN	15	25	M	F	YES	NO		SB
16		RED	Y <del>EL</del> W	GRN	16	82	M	F	YES	NO	Shoulder & Leg Fr	HMC
17		RED	Y <del>EL</del> W	GRN	17	30	M	F	YES	NO	Shoulder disloc Facial	UW
18		RED	Y <del>EL</del> W	GRN	18		M	F	YES	NO	Weakness neck arm	UW
19	12:15	RED	Y <del>EL</del> W	GRN	19	45	M	F	YES	NO		UW
20		RED	Y <del>EL</del> W	GRN	20	35	M	F	YES	NO		CH

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# PATIENT IDENTIFICATION





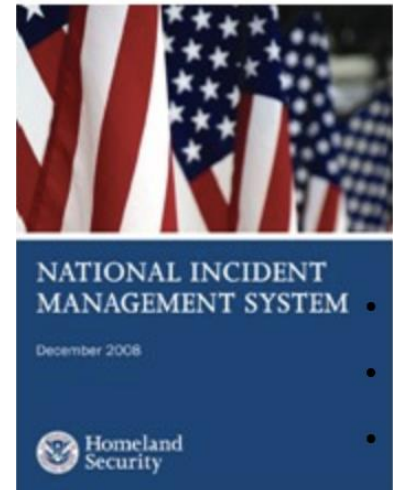
# SYSTEMS APPROACH TO LOSS

Fire Department and Emergency Med Services

- Incident Command System

Hospitals

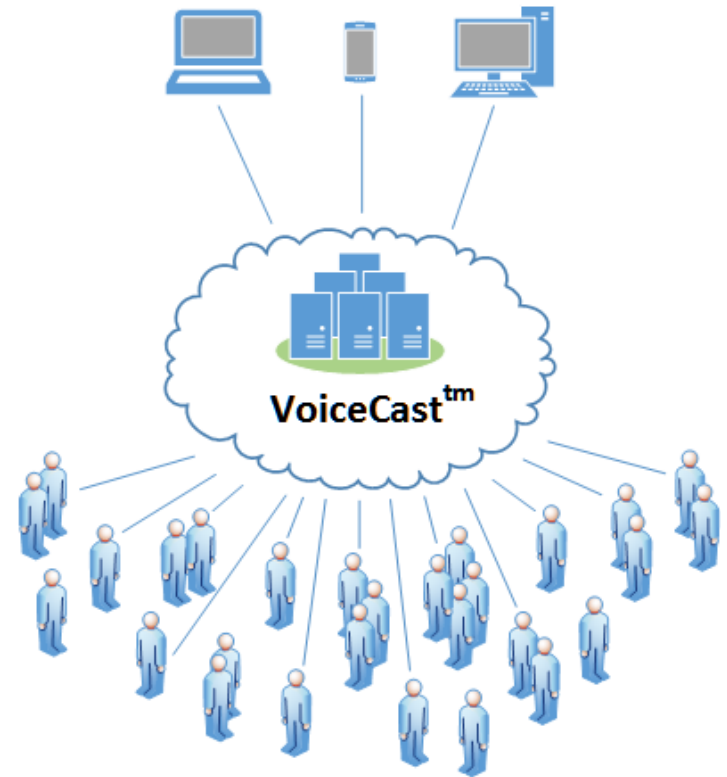
- Hospital Incident Command System



# STAFF NOTIFICATION

## Redundant Notification Using Differing Systems

- Call in conference line
- Text page notification
- Email notification



*Using a novel technology for disaster staff notification*

Stephen C. Morris, MD, MPH  
Janice K. Pelley  
Steven H. Mitchell, MD, FACEP

*J Emerg Manag.* 2016 Nov/Dec;14(6):431-433

# REDUNDANT ACTIVATION SYSTEM

Three main message groups:

1. **Alert message-** something happened/is happening, please stand by (possibly make some arrangements if it looks grave: feed the dog, pack a bag with your food/medicine, etc.)
2. **Activation message-** help is needed: wait on the line or call in for the conference call
3. **Deactivate message-** problem is over, debrief at next staff meeting.





# ROLES AND RESPONSIBILITIES



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# ROLES AND RESPONSIBILITIES



# PLAN FOR EVERY DEPARTMENT

**Harborview Medical Center**

**Department of Surgery**

**Departmental Disaster Plan**

**Chief of Service: Ron Maier, MD**

**Contributors: Eileen Bulger, MD, Anne Newcombe RN**

**Harborview Medical Center and  
University of Washington Medical Center  
Department of Emergency Medicine  
Disaster Plan**

**Stephen Morris MD, MPH**



**Harborview Medical Center**

**Department of Medicine**

**Departmental Disaster Plan**

**Last Updated September 9, 2013**

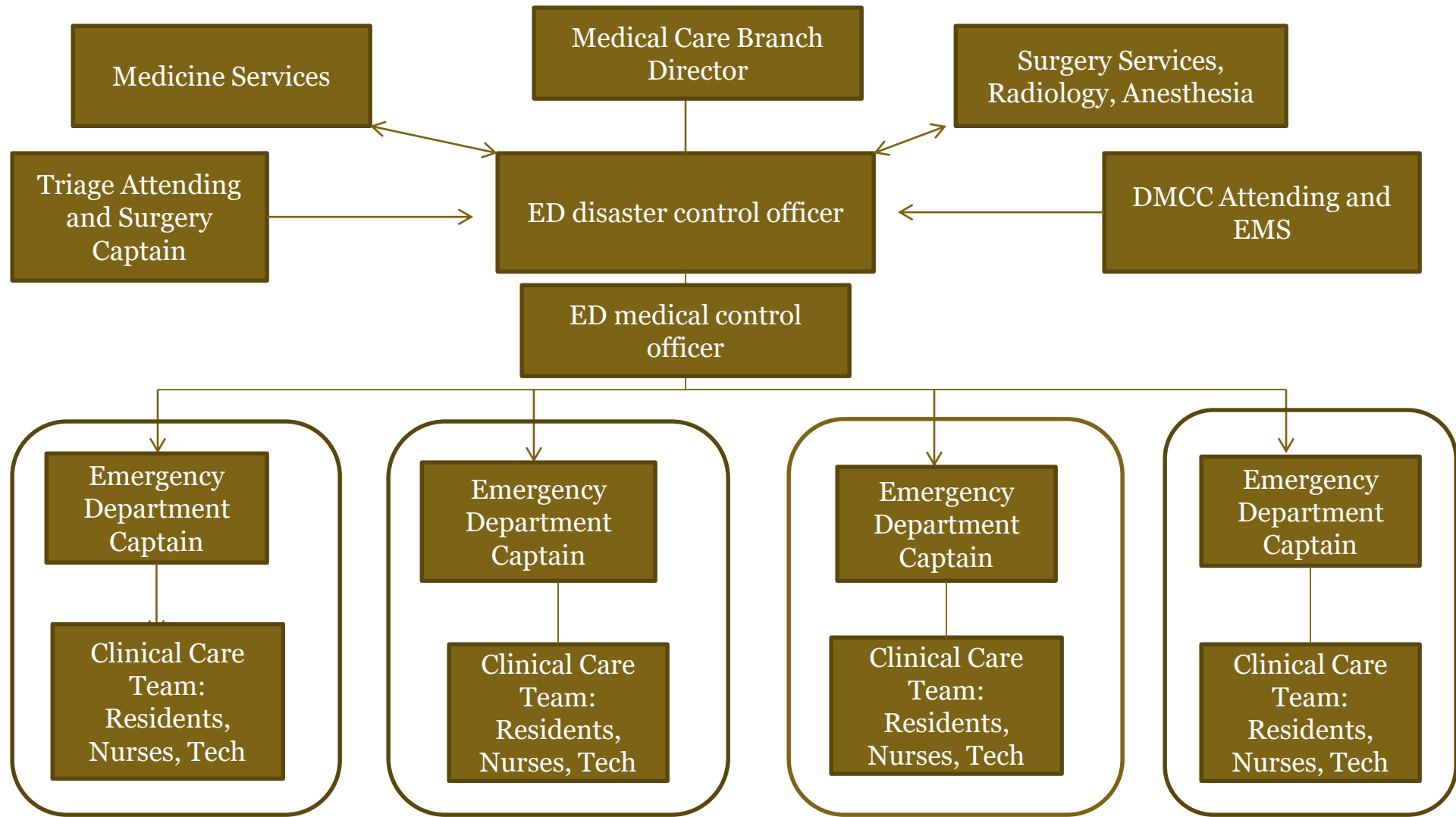
**Chief of Service: Virginia C Broudy MD**

**Contributors: David Carlbom MD, Anne Newcombe RN, Anneliese Schleyer MD**

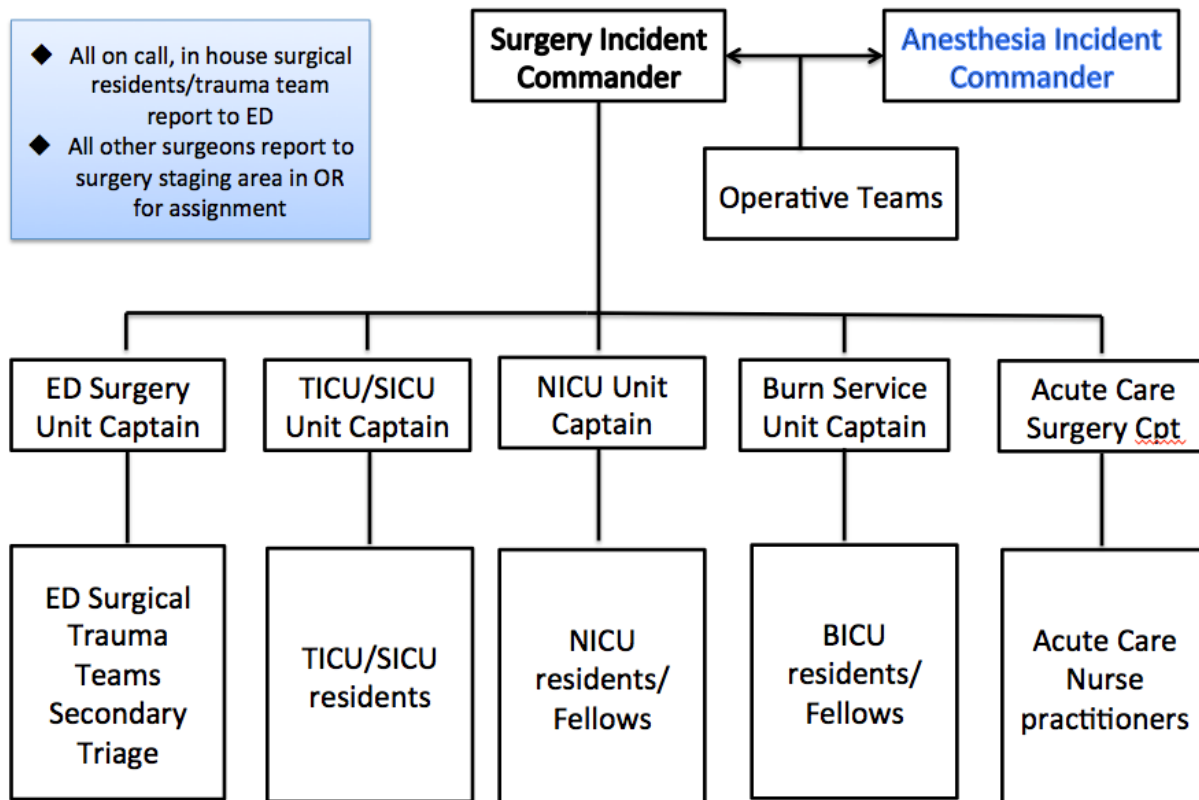




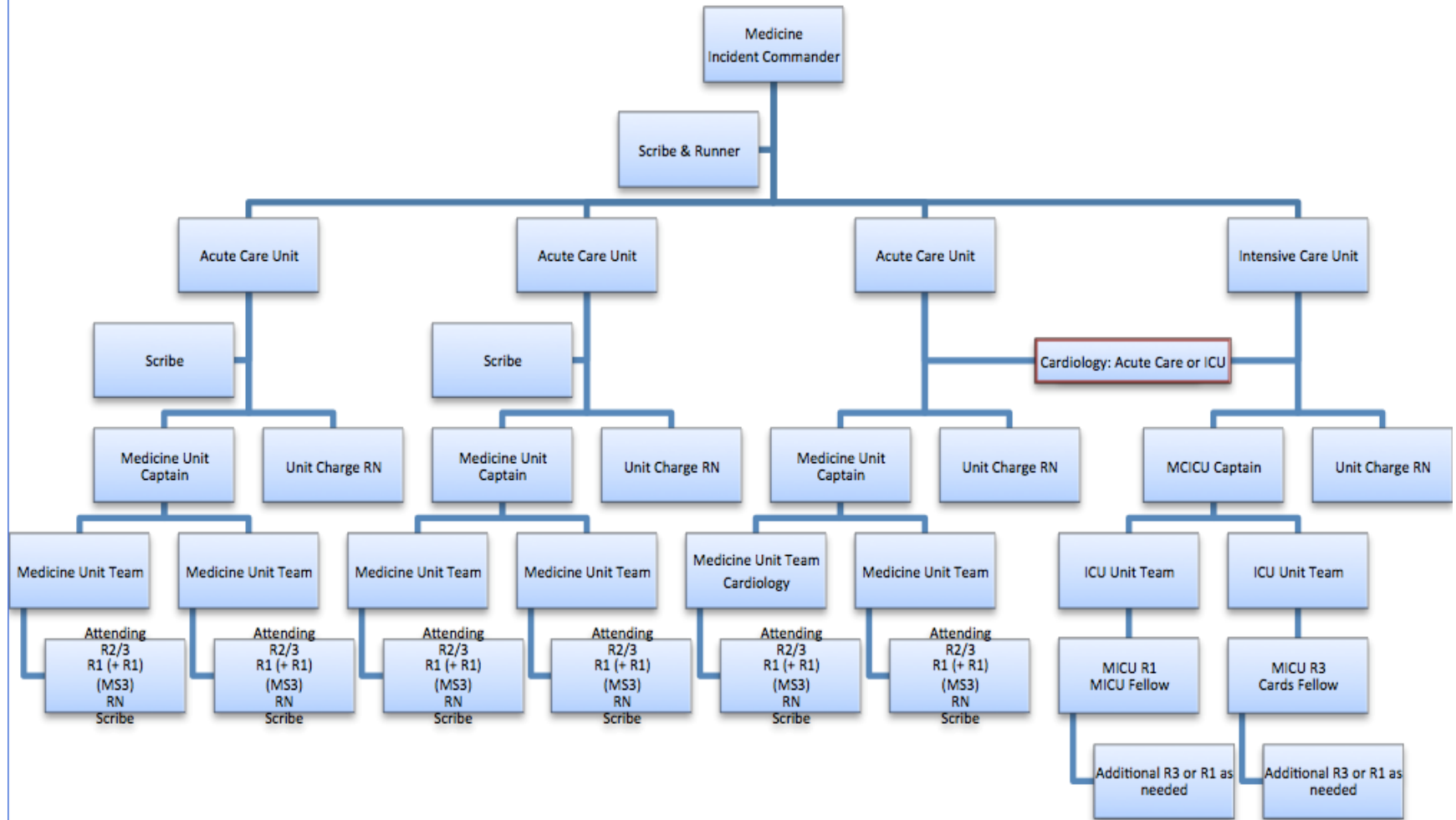
# EMERGENCY DEPARTMENT PLAN



# SURGERY DISASTER PLAN

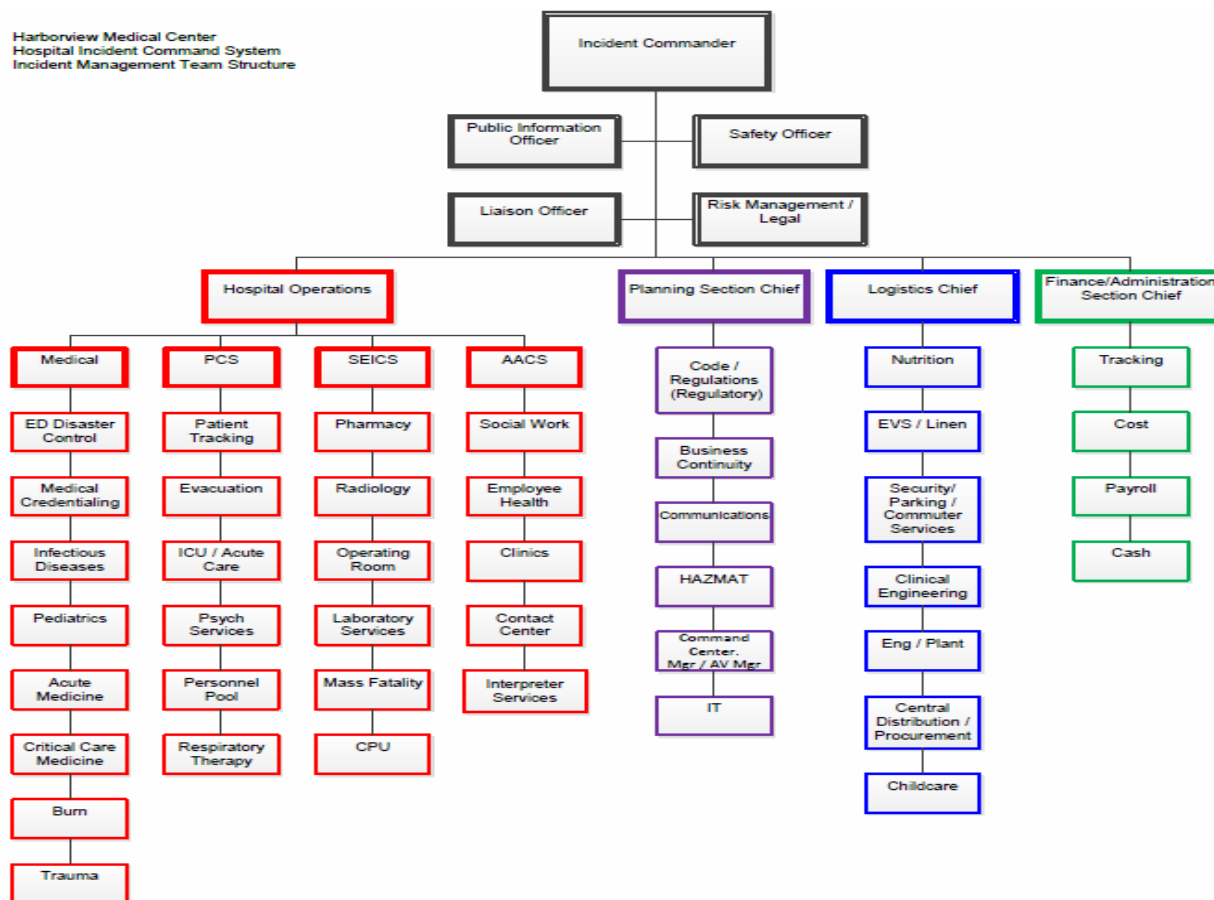


# INTERNAL MEDICINE DISASTER PLAN



# HARBORVIEW DISASTER PLAN

Harborview Medical Center  
Hospital Incident Command System  
Incident Management Team Structure





# SYSTEMS APPROACH TO LOSS

- Key Concepts

- Staff need to understand where to report and help
  - Divert people **AWAY** from Emergency Department
  - Work in the area of the hospital where they normally practice
- Empty the Emergency Department – create space
- Discharge patients from the hospital
- Non-surgical teams assume care of existing surgical patients



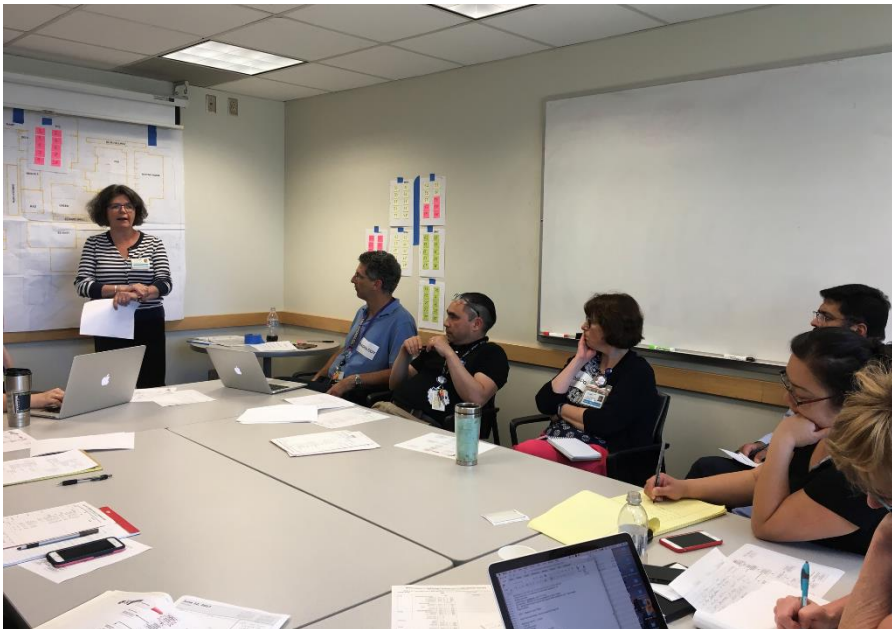
# SYSTEMS APPROACH TO LOSS

- Distributed 51 patients to area hospitals
- 19 patients to Harborview Medical Center
- 1:41 minutes from first dispatch – all patients transported



# SYSTEMS APPROACH TO LOSS

- After Action Report/Lessons learned:
  - Naming convention
  - Radiology integration into disaster plan
    - Radiology captain for results distribution
  - Caching key ED surgical supplies





# SYSTEMS APPROACH TO LOSS

## Communicate – Publish Lessons Learned

- Radiology access major issue – blunt trauma incident
  - 12 Whole body CT's in 101 minutes
  - 3 CT scanners
  - Approximately 1 scan every 15 minutes per scanner
  - Communicating results

Emerg Radiol (2017) 24:47–53  
DOI 10.1007/s10140-016-1441-y

ORIGINAL ARTICLE

### **Emergency radiology and mass casualty incidents—report of a mass casualty incident at a level 1 trauma center**

Ferdia Bolster<sup>1</sup> · Ken Linnau<sup>1</sup> · Steve Mitchell<sup>1</sup> · Eric Roberge<sup>2</sup> · Quynh Nguyen<sup>1</sup> · Jeffrey Robinson<sup>1</sup> · Bruce Lehnert<sup>1</sup> · Joel Gross<sup>1</sup>

# SYSTEMS APPROACH TO LOSS

QUESTIONS?

