**Core Disaster Medicine Education (CDME) for Emergency Medicine Residents**

**Appendix 1:** Full list of ranked Emergency Medicine residency Disaster Medicinetopics and objectives

**1. Patient Triage in Disasters**

• Explain the difference in goals for conventional vs. disaster triage

• Demonstrate the ability to sort patients into triage categories that optimize outcomes in scarce resource settings

• Understand the modifications in triage necessary in mass gatherings, CBRNE and infectious disease environments

**2. Surge Capacity/Capability**

• Explain the difference between medical surge capacity and capability

• Identify and define the 3 basic components of surge capacity (staff, stuff, structure/space)

• Name common barriers in the ED and in the hospital to creating medical surge capacity and capabilities

• Describe how surge needs are different between a no-notice incident and a slowly evolving incident

• Participate in a process (e.g. Kaizen, work group, hospital disaster committee) that identifies adequate personnel, supplies, equipment and space for a patient care surge of 50 or more patients

• Describe the surge capabilities and limitations of your local emergency medical care system (EMS and hospital) Describe the processes used by public health authorities to support and manage medical surge at the local and state levels

• Give examples of at least 2 types of alternate care sites, and list at least 3 functions and 3 limitations of an alternate care site

• Identify the medical surge capacity assets available in your health care system and community, and identify those which can be deployed in a disaster or public health emergency

• Describe the processes your organization may use to expand:

o Physical space for patient treatment, and

o Personnel, such as callbacks, staff sharing, emergency credentialing or expansion of scope of practice

• Discuss the relationship between surge capacity and capability and the use of crisis standards of care

**3. Introduction to Disaster Medicine/ Nomenclature**

• Define “disaster” and “MCI”

• List the four phases of Comprehensive Emergency Management

• Understand the “all-hazard” approach to disasters

• Explain the concept of “Hazard Vulnerability Analysis”

• Define NIMS, NRF, IMS, ICS, EOP, and span of control

**4. Blast Injuries**

• Describe injury patterns that may result from blast-related forces (blast wave barotrauma, penetrating injuries, blunt force injuries, and miscellaneous injuries such as burns and crush syndrome)

• Discuss assessment and management of high-order explosive injuries caused by barotrauma to the ears and intestine, with emphasis on blast lung injury, both in the prehospital and emergency department setting

• Identify how the triage and care of blast victims differs from standard triage (immediate and delayed onset injuries)

**5. Hospital Disaster Mitigation, Preparedness, Response and Recovery**

• Understand all hazard preparedness and planning

• Be able to explain the difference between internal and external hospital incidents

• Understand the goals and role of an Emergency Management Committee

• Be able to understand the results of an Hazard Vulnerability Analysis

- Define the 3 elements that support an HVA: probability, consequence, existing preparedness

• Understand the key elements of an Emergency Operations Plan

• List the elements of an effective hospital emergency management program

• Understand the Hospital Incident Command system and the role of the Hospital Command Center when open

• Understand Resource management, Supply and logistics (96 hours requirement, JIT supply issues) and Interagency MOU/MOAs, mutual aid and transfer agreements

• Learn about Personnel Training and competencies, staffing patterns, impacts on ability to staff, and integration of medical staff

**6. Chemical MCI and Hospital Response**

• Identify signs, symptoms and immediate personal safety steps and clinical and response procedures

• Provide needed steps for early notification and mobilization of appropriate hospital and local authorities (including key information and immediate actions to minimize damage and protect personnel, the environment, and public safety)

**7. Decontamination Indications and Issues**

• Describe the indications for and benefits of patient decontamination

• Define the different levels of chemical PPE

• Describe the process and equipment for self-decontamination, and ‘dry’ and ‘wet’ patient decontamination

• Define how decontamination for radiation may differ from decontamination for chemical hazards

• Describe potential hazards of the decontamination process

**8. Trauma MCI**

• Explain the importance of prospective MCI planning

• Understand the characteristics of a mass casualty incident (MCI) vs other forms of disaster

• Learn how to initiate a hospital response in a conventional MCI (ED, OR/PACU, ICU, hospital command)

• Understand the unique injury patterns of a conventional MCI, including in children

• Understand the impact of an MCI on local and regional medical and public health resources

• Understand utility of tourniquets in the context of traumatic MCI

**9. Disaster Exercises and Training**

• Explain the importance of training and exercises in disaster preparedness

• Describe the differing types of discussion based exercises (seminars, workshops, tabletops, games) and operations based exercises (drills, functional ex, full scale ex)

• Explain the relative strengths and weaknesses of tabletop, functional, and full-scale exercises

• Understand how to design realistic exercises and how to create after action reports and improvement plans through a “hotwash”

**10. Biological Agents**

• List the common agents of bioterrorism and common means of dissemination

• Describe presentations of bioterrorism events compared to endemic diseases

• Describe appropriate treatment and the role of prophylaxis and vaccination for anthrax and smallpox

• Describe the difference between seasonal and pandemic influenza and implications for the healthcare system in a pandemic

**11. PPE**

• Describe the purpose of PPE

• Describe how PPE differs for chemical, radiation, and biological hazards.

• List the appropriate levels of PPE for chemical hazards

• List the PPE levels for biological hazards

• Describe the appropriate PPE for infectious agents such as TB, smallpox, and viral hemorrhagic fevers

• Demonstrate appropriate use of N95 respirators

• Describe necessary screening and training for PPE use

• Explain the importance of donning and doffing PPE correctly

• Demonstrate the appropriate donning, doffing, and disposal of PPE for HAZMAT events

• List common limitations, risks, and troubleshooting techniques for PPE

**12. Radiation MCI and Hospital Response**

• Describe basics of radiation physics

• Demonstrate how to prepare your emergency department for arrival of victims contaminated with radioactive materials

• Describe basics of acute radiation syndrome and how to triage based on initial symptoms

• Explain the need for operative intervention within 48 hours for patients with higher level of exposure

• Describe how emergent medical care interventions may differ in a radiation event from a chemical hazard event.

• Name nationally available resources to assist with response to a radiation event. consult experts: Oak Ridge REAC/TS

**13. IMS (NRF, NIMS, ICS)**

• Complete ICS level 100, 200 and National Incident Management System 700 Certification

• List the primary benefits of using an Incident Management System to respond to disaster

• Explain how the Hospital Incident Command System (HICS) is similar to, and different from, the ICS

• Describe when a hospital should use HICS to respond to an incident

• Define the following terms:

o Unified command

o Unity of command

o Chain of command

o Span of control

Describe the National Response Framework

• Describe the functions of the following ICS sections:

o Command

o Operations

o Logistics

o Planning

o Finance

• Define the following terms:

o Management by objective

o Plain language communication

o Operational period

o Incident Action Plan

o Emergency Operations Center

• Describe how differing organizations’ ICS structures relate to one another within the National Response Framework

• Demonstrate proficiency in the use of the ICS to initiate, deploy, maintain, coordinate, and demobilize assets in a medical disaster exercise or deployment

• Describe the 15 Emergency Service Functions and define the tasks of ESF 8 (health and medical)

• Define the National Response Framework and describe the essential support functions of this framework

• Define the roles of the Emergency Operations Center (EOC) and the Multiagency Advisory Committee (MAC)

**14. Hospital Evacuation**

• Hospital evacuation basics

• Congregate facilities (e.g., nursing homes, child welfare facilities)

• Medical needs of other vulnerable populations during evacuation

• Resource conflicts during a jurisdictional evacuation order (local Emergency Management Interface)

**15. Communication**

• Understand the typical communication disruptions seen in disasters

• Learn alternate methods of communication (eg, runners, walkie-talkies, ham radio)

• Understand the typical communication issues within and among agencies

• Distinguish between interagency and intra-agency (bidirectional) communication

• Describe the role of the public information officer (PIO) and a joint information center

• Explain the importance of media management and crisis and emergency risk communication to the public

**16. Safety and Security**

• Describe security actions necessary to protect the safety of patients and staff during a disaster, including access control procedures

• Discuss how actions will differ based on the context of the event (directly impacting the facility or occurring locally, versus occurring regionally)

• Identify areas of potential vulnerability in the emergency department physical plant

• Appreciate the critical role that effective internal and external communication plays in establishing and maintaining the safety and security of the ED

**17. Health Consequences of Different Disasters**

• Describe common injury patterns associated with the following types of events:

a. Natural and environmental disasters

i. Earthquakes

ii. Floods

iii. Hurricanes/cyclones/typhoons

iv. Extreme cold

v. Extreme heat

vi. Landslides

b. Transportation incidents

c. Hazardous chemicals incidents

d. Radiation incidents

e. Structural collapse

f. Explosions

• List the common effects of disasters on a community’s access to medical care, water, food, and sanitation

• Describe the health and medical risks created by mass sheltering of populations and name strategies to mitigate those risks

• Name examples of populations who may suffer disproportionate health consequences of disasters and explain why

• Describe common mental health consequences of disasters and name common effective interventions

**18. Building Collapse Injuries and Medical Management**

• Describe how first responders locate victims in collapsed buildings and how to predict outcomes based on time elapsed since incident

• Define compartment syndrome and describe the diagnosis, field and hospital treatment of this condition

1. Define crush syndrome and describe diagnosis, field and hospital treatment of this condition. What is the “smiling death”?

• Describe the techniques used for renal preservation

• Describe the indications for, and technique of, field amputation

**19. Personal and family preparedness**

• Describe the essential elements of a family disaster plan – outline key areas of the plan (communication, what to do if separated, individual responsibilities, what to do if evacuated) http://www.redcross.org/prepare/location/home-family/plan

• Name the contents of a disaster kit for home use [https://www.ready.gov/build-a-kit or http://www.redcross.org/get-help/prepare-for-emergencies/be-red-cross-ready/get-a-kit]

• Identify items germane to the unique geographic location

• Explain why having a prepared family enhances individual readiness to respond professionally

**20. Psychological Effects**

• Describe the principles of psychological first aid

• List common symptoms of acute stress reactions

• List risk factors for development of post-traumatic stress disorder

**21. Terrorism**

• Define terrorism

• List steps a hospital may take to mitigate against (target-harden) terrorist attack

• Describe common terrorist attack methods in the US and globally

• Define potential threats to responders during a terrorist attack (including secondary attackers and devices)

• Describe principles of a successful response at the scene of an active shooter incident

**22. Ethical Issues**

• Explain the basic ethical principles of disaster medicine

• List different ethical principles that can provide conflicting guidance for protection of individuals vs. populations and often conflict between populations (e.g. age-related decisions)

**23. Isolation/Quarantine**

• Define quarantine and define isolation

• Explain typical situations where quarantine is likely to be useful and situations where it is not

• Describe the differences between voluntary and involuntary quarantine

• Explain the public health role in isolation and quarantine

• Understand quarantine/isolation authorities in your state relative to EM practice

• Describe application of the 3I Tool (Identify-Isolate-Inform) in an infectious disease public health emergency

**24. Recognition, Notification, Initiation, and Data Collection**

• Recognize a disaster is in progress

• Assess and report the conditions considering situational awareness, environmental/geographic factors, potential hazards, and need for additional resources

• Notify the appropriate persons/agencies

• Key individuals; local, regional, statewide, and federal disaster agencies

• Initiate/activate the disaster plan

• Identify important data for inclusion in post-event reports

**25. Incendiary Event Injuries and Medical Management**

• Understand standard burn care and smoke inhalation treatments

• Learn treatment of cyanide, carbon monoxide, and phosgene exposures

**26. Legal Issues**

• Describe the legal and regulatory issues most likely to be encountered in disasters and public health emergencies (standards of care, mandatory evacuations, quarantine, HIPAA, EMTALA)

• Describe legal issues and challenges associated with allocation of scarce resources in a disaster or public health emergency (use of triage and other allocation strategies)

• Discuss state statutes, rules, and orders related to health care delivery that may be activated or modified under a state or federal declaration of disaster or public health emergency (Model State Emergency Health Powers Act).

• Explain “standard of care” and how that term applies to disaster care

• Define crisis standards of care

• Identify basic issues impacting liability and malpractice during a disaster

**27. Prehospital Disaster Management:**

• Understand Prehospital incident command/Unified Command

• Learn treatment area designation and functions

• Identify the transport issues in mass casualty disposition, and the flexible, scalable EMS strategies used to address them

• Understand the integration of public safety (police, fire, EMS, etc), public works, interoperability and mutual aid

**28. Patient Identification and Tracking**

• Describe the purpose and function of patient tracking systems in disaster

• List the pros and cons of commonly used systems

• Understand the tracking system through the continuum of disaster care from EMS to hospitals for patients in your area

• Understand the use of recordkeeping processes to ensure continuity of patient information

• Understand family reunification procedures in your area

**29. Populations with Functional and Access Needs**

• List different groups who may be considered to have access and functional needs in a community depending on the disaster

• Understand the potential impact of those with special medical needs (e.g. dialysis, ventilators) on the healthcare system during disasters

• Describe specific challenges when dealing with children, the elderly, dementia/memory care, mental health, physical disabilities, and other at-risk populations

• Describe resources and planning considerations for at-risk and functional needs populations (e.g. EmPower)

**30. Resource Management:**

• Identify the appropriate authorities for resource management at the local, state and federal levels in disaster

• Explain the limitations of authority for resource management in a disaster

• Explain the relationship between situational awareness and effective resource management

• Describe the pros and cons of developing detailed resource inventories in advance of disaster events

• Describe the role of medical coalitions in the management of resources in a disaster

• Describe the local system of medical materials acquisition and distribution in a disaster

• Describe how medical resources, including disposable supplies, durable equipment, pharmaceuticals and other resources are distributed in a disaster in the local emergency medical care system

• Describe how local resources are managed, and how regional, state and federal resources are requested in the local emergency medical care system

• Describe how changes such as altered or crisis standards of care are implemented when demand outpaces supply for medical resources in a disaster

• Define the terms mutual medical aid and interoperability, and identify local mechanisms, such as memorandums of understanding, that are used to provide these functions in the local emergency medical care system

**31. Public Health Assessments and Intervention**

• Define the public health principles and practices used for the management of populations affected by disasters

• Define Rapid Needs Assessment

• Describe at least 3 of the most frequent public health consequences of disasters

• Describe at least 2 common public health practices used for the public health consequences described above

• Describe at least 3 strategies used to address functional and access needs of special populations (elderly, young, disabled, physically or psychologically challenged) and mitigate their effects following a disaster

• Describe at least 3 risk reduction measures utilized to mitigate hazardous exposures during a disaster

• Describe what entities are responsible for the provision of mass care following a disaster (ESF-6)

• Describe the logistics needed to support a public health response following a disaster

• Describe how vaccinations and prophylactic medications are delivered in the local jurisdiction following a disaster

• Describe the provision of health investigations following a disaster in the local jurisdiction

• Describe the role of Public Health in monitoring the environment following a disaster

**32. Contingency, Continuity, and Recovery**

• Define continuity of operations and continuity of government

• Define business continuity planning

• Describe the national recovery framework

• Identify and select the key components and appropriate activities required to optimize contingency response capabilities and capacity that ensure continuity and recovery

**33. Volunteer Management**

• Invited, spontaneous or convergent

• Managing, deploying, delegating appropriate tasks and supervising volunteers

• Explain why emergency credentialing of volunteers is important

• Emergency System for Advanced Registration of Volunteer Health Professionals

• (ESARVHP)

• Given any disaster, the emergency physician will recognize the significant and flexible asset that unplanned volunteers represent, and will capitalize on these available resources while ensuring safety and the volunteer’s ability to effectively perform tasks within their capabilities and the established incident command system

**34. Tactical Emergency Medicine**

• Recognize the unique medical education, training, standards and support requirements to ensure optimal tactical operations in hazardous and austere environments

• Understand medical support principles for tactical operations (emergency medical technicians, physicians, physician assistants, and nurses)

• Enable law enforcement to operate more efficiently, effectively and with reduced risk

**35. Fatality Management**

• Define the concept of Fatalities Management

• Discuss why an organized fatalities management plan is critical to the success of a hospital’s overall disaster response

• Describe the appropriate bagging and storage, identification/labeling, reporting, and tracking of the dead

• Discuss why dead bodies generally do not spread disease (immediate burial contraindicated)

• Describe how this process changes if the body is contaminated

• Outline precautions necessary to safely handle dead and decomposing bodies

• Outline procedure for providing information about the deceased to family members, law enforcement and governmental agencies

**36. Government Organized and NGO Sponsored Response Teams**

• Define the purposes and capabilities of at least 3 GO and NGO sponsored response teams

• Describe at least 3 limitations that GO and NGO response teams face

• Describe at least 1 national and 1 international disaster response mechanism for GO and NGO responses

• Describe the WHO classification system of Emergency Medical Teams

**37. Strategic National Stockpile (SNS)**

• Explain what is in the Strategic National Stockpile, and how it is activated and managed.

• Describe the terms push-pack, chempack, vendor managed inventory, medical countermeasures

• Describe key elements of planning for medical countermeasures distribution

• Define open PODs and closed PODs and the different attributes of each

**38. Sheltering**

• List reasons that sheltering may be needed (weather, utilities)

• Describe the medical needs of the general shelter population

• Describe how at-risk and functional needs populations can significantly affect the medical needs in a shelter environment

**39. Transportation**

• Understand the critical role of efficient and expeditious transportation during a disaster

• Identify optimum initial distribution of casualties and challenges of re-distribution after a disaster

• Describe limitations on patient movement capability including critical care resources and alternatives to ambulance transport

• Understand the resources available from Federal agencies (e.g. national ambulance contract, NDMS)

• Identify patient groups that may have unique transportation needs following a disaster

**40. Evidence Preservation**

• Describe at least 3 potential disaster events requiring evidence preservation and identify the materials that may need to be preserved

• Describe appropriate techniques for evidence preservation

• Explain the relationship between law enforcement and the medical system following a terrorist or other forensic event requiring immediate collection of witness and physical evidence to protect public safety

• Describe the relationship of law enforcement to HIPAA following a terrorist event