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# Introduction

The primary goal of the study was to examine the use of a logic model to align a training program's activities and assumed inputs with its intended effects over time, to determine whether the use of the model facilitated significant, durable learning and increased engagement and impact.

This supplement describes the training program that was designed as an activity of that logic model. The training program was designed to improve disaster preparedness in the Bronx, Westchester County and the Hudson Valley by:

* Improving the comfort level and knowledge of participants related to disaster preparedness competencies
* Increasing the pursuit of further training by participants in the field of disaster preparedness
* Increasing engagement in hospital emergency operations planning by participants

# Curriculum Design

The full training program was comprised of an 8-hour single day workshop at the Montefiore Einstein Center for Innovation in Simulation (MECIS), four prerequisite online modules, and a website with additional resources and training information that was provided after the workshop.

The outcomes-based architecture of the curriculum design was oriented to Entrustable Professional Activities (EPAs). We chose this orientation to EPAs to keep the curriculum design focused on the demands of authentic practice. The specific learning objectives were articulated as performance-based outcomes. They were categorized using Fink’s Taxonomy of Significant Learning to encourage deep, durable learning through personal relevance, and to guide the selection of learning and assessment activities. The target outcomes were also correlated to a validated disaster preparedness competency framework (Hsu et al., 2006).

### Entrustable Professional Activities

The MCI Foundations training was designed to enable the following EPAs:

EPA1: Identify a potential critical event, appropriate safety precautions for that event type and perform the appropriate simulated notification and actions for mobilization.

EPA2: Identify the Incident Command System (ICS) defined individual task and scope of responsibility.

EPA3: Correctly utilize the TeamSTEPPS principles of “Brief, Huddle and Debrief” during a mass casualty exercise.

EPA4: Apply knowledge and skills concerning disaster triage systems to rapidly assign victims to appropriate triage categories.

### Competencies

We correlated our training program to healthcare worker competencies for disaster training published by Hsu et al.

C1: Demonstrate critical event safety principles

C2: Operate within one’s assigned role as part of a collaborative team

C3: Assume an ICS functional role below section chief in an emergency or disaster

C4: Demonstrate effective critical event communications to share threat information with staff

C5: Demonstrate processes to rapidly notify department staff, patients and patients’ families of events and keep them updated

C6: Leverage appropriate guidelines, procedures, technology, and best practices to navigate a critical event

C7: Apply personal and professional ethics

C8: Demonstrate disaster triage knowledge and skills

C9: Demonstrate decontamination skills for persons of all ages, ambulatory and non-ambulatory

C10: Direct and coordinate the activities of other team members

C11: Adjust strategies based on information gathered from the environment through the use of compensatory behavior and reallocation of intra-team resources.

### Learning Outcomes

This is a complete list of our specific learning outcomes, correlated to the EPAs and competencies listed above. The rigor of these correlations ensured the deliberate design of the curriculum.

* Recall characteristics of a mass casualty incident. (EPA1, C1, C4, C8, C9)
* Analyze a given situation and determine whether it is a mass casualty incident. (EPA1, C1, C5, C6)
* Recall the initial notification and mobilization actions required in a mass casualty incident. (EPA1, EPA 2, EPA 3, C5)
* Identify required resources needed in a mass casualty incident. (EPA1, EPA2, EPA3, C1, C4, C6)
* Explain the purpose of the HICS (EPA1, C1)
* Initiate HICS (EPA1, C1, C2, C3)
* Open the disaster cart (EPA1, C2, C5)
* Recall the roles and responsibilities of the response team as defined by the HICS (EPA1, C2, C3, C5)
* Recall the procedure for assigning roles during the initial response (EPA1, C2, C3)
* Recall best practices for staff huddles during the initial crisis response (EPA4, C3, C10, C11)
* Explain how roles and responsibilities may change during a crisis as it develops and expands (EPA4, C3, C10, C11)
* Recall procedures for brief, huddle, and debrief (EPA4, C10, C11)
* Perform a rapid physical assessment of a victim (EPA2, C8)
* Assign victims to triage categories (EPA2, C8)
* Explain and analyze the ethical dilemmas that may present with disaster triage (EPA2, C7, C8)
* Recall common safety threats related to mass casualty incidents. (EPA3, C1, C2, C3, C4, C10)
* Recognize safety threats and identify the appropriate precautions and mitigations. (EPA3, C1, C2, C3, C4, C10)
* Evaluate an existing hospital emergency operations plan (EPA1, EPA3, C2, C3, C4)

The specific training activities were designed to enable the targeted learning outcomes and to support the spectrum of Fink’s Dimensions of Significant Learning. The design and delivery of these activities was focused on learning that was accurate, authentic, and durable.

The following table contains the activities that comprised the training categorized by Fink’s dimensions.

|  |  |
| --- | --- |
| **Fink’s Dimension** | **Training Activities** |
| Foundational Knowledge | Online Pre-work  |
| Rapid-Fire Panel Discussion |
| ApplicationIntegrationHuman Dimension | Tabletop Triage |
| Tabletop Comprehensive |
| Immersive Simulations |
| Caring | 3-Minute Message |
| Learning How to Learn | Learning Goal List |
| Stamped Postcards |

# Training Program Summary

### Online Pre-Work

Three weeks prior to the workshop, participants completed a pretest to establish their baseline disaster medicine knowledge. This pretest was modeled on a learning assessment technique called First Day Final that requires participants to take a summative test prior to participating in the program. They identify the questions they found easiest and those they found most difficult. The purpose of this evaluation is that it will test prior knowledge and give the participants a preview of what the program will offer. Participants can use their knowledge regarding their strengths and weaknesses to focus their efforts. At the end of the program, they can see the gains they made in deepening their foundational knowledge.

For our program, participants took the same summative test upon conclusion of the training program and again six months later. We presented four multiple choice questions per category/online module. While the questions were not presented to participants grouped in categories, each question was labelled with its category (i.e. TRIAGE; ICS). Participants were asked which two topics they found most difficult and which two topics they found easiest.

You may access the First Day Final pretest here: <https://wphospital.author.realcme.com/author/externalreview/7773774f1bdca7a222>

The pretest online module also included a learning goal list activity which required learners to generate and prioritize a list of their learning goals. This was done at the beginning of the training program focus participant learning on their own self-development. Goal identification can be a powerful focusing activity for helping students become conscious of what they hope to accomplish and also encourage them to accept responsibility for their learning.

Survey data through a five-point Likert scale was also collected at this point to gauge familiarity with core MCI competencies. Then participants were asked to complete three online multimedia modules: HICS, Disaster Triage, and Team STEPPS.

The online modules were self-paced, asynchronous learning experiences intended to support the acquisition of foundational skills and knowledge prior to the experiential workshop. They were comprised of videos, text, links, and formative assessments with feedback.

Module 1: HICS

<https://wphospital.author.realcme.com/author/externalreview/13c8bdccf6b3130277>

Module 2: Triage

<https://wphospital.author.realcme.com/author/externalreview/3bdcc11f1c608fcd91>

Module 3: Team STEPPS (communication)

<https://wphospital.author.realcme.com/author/externalreview/07484d9b67e2d21a7d>

### MCI Foundations Workshop

The in-person workshop was an 8-hour immersive program held at the Montefiore Einstein Center for Innovation in Simulation (MECIS). Participants were divided into two groups that rotated among whole-group and small-group activities throughout the day.



The day began with an introduction and then continued with four, 15-minute “rapid fire” panel discussions led by disaster experts covering each of the four content categories: Safety, HICS, Disaster Triage, and TeamSTEPPS. Then, in small groups, participants performed a simulation exercise and a triage tabletop.

The triage tabletop aligned to Fink’s levels of *Application* (knowing how to use content) and *Integration* (applying it to a wide range of scenarios). During this tabletop, participants worked in small groups to triage a large volume of patients using the adult and pediatric Simple Triage and Rapid Treatment triage tools, START and JumpSTART. The exercise required them to allocate resources in their fictitious hospital while also managing acute distractions in the form of actors disrupting their group. Examples of distractions included panicked family members, police officers, intoxicated patients.

The simulation exercise, a building collapse, aligned to Fink’s *Application* and *Integration* as well, but also added *Human Dimension* (identifying personal and social implications). This simulation included 10 patient mannequins and 15 professional actors. It required participants to quickly activate and find their role within a hospital incident command system. They were asked to detect and mitigate safety threats including elopement from a suicidal patient, triage using START and JumpSTART algorithms, and communicate effectively during a very chaotic scenario.

After lunch, learners participated in a Three-Minute Message activity. They were given 10 minutes to prepare a 3-minute presentation on one of the following topics: HICS, Disaster Triage, TeamSTEPPS or Safety Assessment. Their presentations had to answer one of the following questions with clear examples:

1. How did the activities of this morning change the way I think about (the topic)?
2. What is one challenge I faced in the first set of activities this morning that I feel better prepared going into the afternoon?

Given the limited time frame, the Three-Minute Message forces participants to choose the most essential part of their message. This activity focuses on the *Caring* dimension of Fink’s Taxonomy as learners grapple with articulating their ideas and exposing their thinking.

In the afternoon session, participants performed a second simulation exercise and a comprehensive tabletop exercise, both focused on active shooter scenarios. The second simulation scenario also involved 10 patient mannequins and 15 professional actors. The tabletop was focused on the HICS framework and also used actors to create authentic distractions. Both afternoon exercises focused on activating the incident command system and finding one's role in it, communicating during a chaotic scenario, and performing a safety assessment. The simulation also included a detailed experiential triage exercise using the START and JumpSTART algorithms.

At the conclusion of the program, participants were asked to complete a “Commitment to Change” form that documented three changes they intended to make in their practice as well as perceived barriers to change. This “Commitment to Change” was sent to participants three months later along with a questionnaire asking if they were able to fulfill their commitments and what barriers they actually faced. This qualitative information allowed the MCI Foundations team to account for the influence of external factors preventing learning success and hospital emergency operations engagement. To support continued learning, participants were given access to a website made for the MCI Foundations program that contained information about local and regional meetings, courses being offered within the community and online courses.

# Extra Resources

***Please contact the authors for course material details regarding the tabletop and large-scale simulation exercises.***