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TITLE: New York Medical College Bioterrorism: CDM Disaster Medicine and Emerging Infections Training Center

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Report prepared as re-submission of original report in the absence of the original principal investigator who is no longer employed by the academic institution of record.

14. ABSTRACT
This project was aimed at creating a pilot emergency management training program. This program would then be delivered to target test audiences with pre and post-course cognitive, psychomotor and affective evaluations. During this year of the project the first round of pilot courses were designed and delivered followed by further targeted skills-based training that was revealed by participants in the pilot courses to be necessary for the mastery of subject knowledge and self-efficacy. Further pilot programs in additional disaster medicine-related topic areas are planned in the final year of the project.

15. SUBJECT TERMS
Training; Disaster; Bioterrorism; Self-efficacy; Confidence; Skill-based Training; Education; Evaluation; Pandemic; Alternate Care Site

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1. **INTRODUCTION:** This project supports training that focuses on emergency operations center roles and functions, hospital decontamination capacity, emergency preparedness and terrorism operations, and public health emergency management training to be delivered to local responders, health care agencies, public health departments, and would be available to staff at local military agencies in the greater New York City and Hudson Valley, NY region. The pilot training program(s) developed under this program are designed to use evidence-based medicine and military lessons learned to improve the preparedness of civilian first responders and health professionals to manage mass casualty incidents arising from disasters, acts of terrorism and public health emergencies. Various evaluative methodologies for the determination of the effectiveness of the pilot educational programs are employed and revisions to curricula are made based on this analysis prior to region-wide dissemination of core curricula.
2. **KEYWORDS:** Training; Disaster; Bioterrorism; Self-efficacy; Confidence; Skill-based Training; Education; Evaluation; Pandemic; Alternate Care Site
3. **OVERALL PROJECT SUMMARY:** This project was aimed at creating pilot emergency management training programs. These program would then be delivered to target test audiences with pre and post-course cognitive, affective, and psychomotor evaluations. During the period of 12 September 2013 through 11 September 2014, evidence-based curricula were designed and developed and the first round of pilot courses were delivered and evaluated. Knowledge gaps identified following the delivery of the pilot curricula were addressed by additional targeted skills-based training programs to supplement the original trainings. These were determined to be necessary for the mastery of subject knowledge and the ability of participants to have demonstrated confidence or self-efficacy if performing learned skills in actual disasters. Further pilot programs in additional disaster medicine-related topic areas were planned in the final year of the project through March 11, 2015.

The following is a summary of the workplan progress and completion based on the original project goals described by Dr. Markenson in previous technical reports.

Goal 1: Design curricula and course materials for two pilot training programs consistent with recent regional needs assessments for the public health and disaster medical response to CBRNE events and public health emergencies.

During this project period the curricula and course materials for the first of two pilot training programs was designed and developed. Using the data from regional needs assessments and meetings with members of the Hudson Valley, New York Regional Preparedness Council (RPC) it was identified that a priority training need existed to educate and train public health nurses and members of the medical reserve corps (MRC) how to operate in a clinical capacity within an alternate care site (ACS) during a declared public health emergency following a bioterrorism event, pandemic, or other public health emergency when hospitals are unable to admit patients and health departments must establish community-based care centers (CBCC) in order to treat patients too sick to remain at home when no inpatient hospital capacity exists to allow hospital admission.

The needs assessment performed by County health agencies and the New York State Department of Health along with Drs. Markenson and Reilly at the New York Medical College, Center for Disaster Medicine identified public health nurses and members of the volunteer Medical Reserve Corps as needing detailed orientation as to the clinical roles and responsibilities necessary to provide patient care in these alternate care settings. A significant issue brought up during the needs assessments was that most public health nurses self-reported low levels of clinical confidence performing bedside nursing since their roles were substantially different as health department nurses. Additionally, members of the MRC which is managed locally by each County Health Department in New York State are comprised of both clinical and non-clinical members. Non-clinicians require training on specific logistic and administrative roles and duties while many members of the MRC who have been previously clinically trained were currently retired or not practicing as clinicians and also required refresher-type training and orientation to population-based disaster medicine.

The curricula that was designed by Drs. Markenson and Reilly was based on the New York State Community-based Care Center (CBCC) medical protocols and standards of care. Additionally, this curricula was created using the specificities of the Dutchess County, NY Department of Health's own alternate care site annex to the County-wide comprehensive emergency management plan.

Course modules were four hours in duration and consisted of a didactic portion, followed by problem-based learning using a group discussion format.

Course materials included a participant manual and power point slide deck.

Goal 2: Pilot courses in health care setting to target audiences.

Each 4-hour course was piloted over two days to allow greater ease of integration into the participants' work schedules and to allow for maximum retention of knowledge by spreading learning into multiple sessions.

Part one of the course was delivered on March 19, 2014 at the Dutchess County, NY Department of Health in Poughkeepsie, NY and was two-hours in duration. 38 members of the County Department of Health and 23 members of the Medical Reserve Corps were in attendance.

Part two of the course was delivered on March 26, 2014 at the Dutchess County, NY Department of Health in Poughkeepsie, NY and was also two-hours in duration. 40 members of the County Department of Health and 28 members of the Medical Reserve Corps were in attendance.

Goal 3: Evaluate cognitive, affective, and psychomotor knowledge and learning pre and post-course delivery to determine if baseline level knowledge has been increased in the workforce.

Formal and informal assessments were utilized in the evaluation of this training program and the pilot deliveries. Both objective and subject data from the instructor, observers, and the course participants were gathered and analyzed in order to identify knowledge gaps, areas of improvement to course delivery and instructional methodology, issues with course materials and to measure if subject matter knowledge increased following course delivery.

Goal 4: Revise course content and delivery methods based on empirical data.

The analysis of the aggregate data collected following the two pilot deliveries of this first training program showed significant deficiencies in two specific areas both related to confidence and self-efficacy.

1. Clinical decision making. Both New York State and County health department plans called for licensed clinicians (nurses) to exercise limited autonomy in basic clinical decision making during a regional public health emergency resulting in a likely shortage of health professionals. The planning assumptions that were integrated into the curricula resulted in participants pushing back on instructors and arguing that they were unprepared and ill-equipped to carry out their intended roles and responsibilities according to the plan.
2. Clinical skills proficiency. The second area of knowledge gap and an area overlooked by the curriculum design team was in the area of clinical skills knowledge and skills proficiency. It was an additional assumption in both the New York State and County Health Department plans that nurses would be proficient in triage, IV access, medication administration, use of a hand-held nebulizer, and oxygen administration. Participant feedback was overwhelming in pointing out to not only the study team but to the Health Commissioner that the clinical staff were not confident that they would be able to perform these duties if asked during a disaster or public health emergency.

In this case, it was determined by the principal investigator along with the Health Commissioner and agency leadership that additional training was necessary to supplement the initial didactic training workshop for the clinical staff targeted in this pilot program. Based on our objective and subjective data we designed an additional three-hour clinical skills training program that provided hands-on psychomotor training on how to perform the following tasks: Triage, medical history and physical assessment, vital signs, oxygen administration, medication administration, IV access, central venous port access, IV infusion maintenance, and administration of hand-held nebulizers.

Critical care paramedics and nurse educators instructed small groups in a round-robin or wave format where participants rotated among several “skills stations” where task trainers and mid and high-fidelity simulation was utilized to enhance skills proficiency and confidence performing skills. The feedback from this experience was overwhelmingly positive. Although instructor feedback was obtained, participant feedback was largely

subjective but meaningful, praising the program and many participants reporting that this was the first time in a 20+ year nursing career that they had practiced these skills after finishing nursing school.

This curriculum for clinical skills training of public health nurses and volunteer clinicians in the medical reserve corps has been such an important topic in the world of disaster medicine and public health preparedness, it has been presented at numerous scientific meetings in emergency and disaster medicine both nationally and internationally over the past four years since the pilot.

Goal 5: Preparation and Submission to TATRC of final deliverables.

At the time of this report deliverables are 50% completed with 1 of 2 pilot programs conducted. Final pilot scheduled for delivery in early March 2015.

4. KEY RESEARCH ACCOMPLISHMENTS:

- Identification of novel method for ensuring self-efficacy among public health nurses with roles providing patient care following disasters and public health emergencies
- Dissemination of best-practices for training public health and medical reserve corps nurses in clinical disaster medicine both nationally and internationally as result of work under this program

5. CONCLUSION: Following the completion of our first of two pilot training programs we have learned the following about the importance and implications of clinical disaster medicine training for civilian clinicians designated for disaster response.

Public health nurses continue to be a critical component of nearly all public health emergency preparedness plans. In points of dispensing (PODs), alternate care sites (ACS), and medical shelters these nurses are often intended to provide clinical care of patients that is beyond the scope of their day-to-day public health nursing clinical roles. In the State of New York, we have noted that asking nurses to perform clinical assessments and treatment of acutely ill or injured victims of disasters of public health emergencies causes a marked decrease in both self-efficacy and the willingness to participate in a disaster response, or even an exercise, that might showcase an individual weakness or area of reduced clinical capacity.

Many public health emergency preparedness plans that call for public health agencies to provide clinical care are predicated on using public health nurses and medical reserve corps personnel to fill critical positions. This is a valid planning assumption since during a public health emergency it is unlikely that nurses from acute care hospitals would be available for population health activities or to supplement public health emergency response plans. A public health nurse who routinely cares for chronic illness, performs epidemiology, infection control, assists with communicable diseases or maternal and child health, lacks certain clinical skills proficiencies that would be necessary for their intended functional role during a disaster or public health

emergency. Specifically these deficiencies include triage, clinical assessment, vascular access, medication administration, etc.) Implementing, pre-event training programs designed to re-familiarize experienced nurses, who may have not performed certain clinical skills or procedures in many years, results in an increase in self-efficacy and an improvement in the willingness of health department nurses to act in their intended clinical roles during a disaster or public health emergency.

6. PUBLICATIONS, ABSTRACTS, AND PRESENTATIONS:

- a. No manuscripts submitted by 9/11/2014.
- b. The Complete Guide to Alternate Care Site (ACS) Planning. A toolkit for success in managing medical surge capacity during a public health emergency. Public Health Preparedness Summit. Atlanta, GA – 4/3/14

7. INVENTIONS, PATENTS AND LICENSES: None

- 8. REPORTABLE OUTCOMES:** The primary reportable outcome of this project year (9/12/13 – 9/11/14) is the development of two unique training programs that when utilized together can assist health departments in mobilizing an otherwise “untapped” clinical nursing workforce to increase the surge capacity of health systems and to staff alternate care sites following a major population health event leading to the collapse of the health care delivery system.

More to follow with the second pilot program in the final project year through March 2015.

9. OTHER ACHIEVEMENTS: Nothing to report.

10. REFERENCES: Not applicable to this report.

11. APPENDICES: Not applicable to this report.