

Concepts in Disaster Medicine

Cite this article: Peace S, Brown JF, Mercer M. Project RESPOND: Development of a new capacity in disaster response. *Disaster Med Public Health Prep.* 18(e101), 1–4. doi: <https://doi.org/10.1017/dmp.2024.84>.

Keywords:

Emergency Medical Services; Emergency Preparedness; Disaster Planning; Policy Making

Corresponding author:

Sierra Peace; Email: sierralpeace@gmail.com.

Project RESPOND: Development of a New Capacity in Disaster Response

Sierra Peace MD¹, John F. Brown MD² and Mary Mercer MD³

¹Emergency Medicine, University of Washington, Seattle, WA, USA; ²EMS Agency, San Francisco Department of Public Health, San Francisco, CA, USA and ³Department of Emergency Medicine, University of California–San Francisco, EMS/Disaster Medicine Fellowship, University of California, San Francisco, CA, USA

Abstract

Response to the coronavirus disease (COVID-19) pandemic revealed gaps in medical supply quality and personnel training and familiarity in San Francisco County, prompting the reexamination of county disaster supply caches and emergency medical services (EMS) system decompression protocols. Project RESPOND (Rapid Emergency Supplies for Prehospital Operations in Disaster) was developed to bridge the gap in patient care infrastructure during short- or no-warning disasters and enhance EMS system offloading by introducing a novel capacity for the safe treatment and discharge of patients with minor injuries from the scene of an event. This design, while scaled to the needs of a unique metropolitan population, can be used as a template for the reimagining of disaster response policy and development of disaster supply caches.

Following the September 11, 2001, terrorist attack in New York City, it became a priority to better prepare metropolitan areas to respond to short- or no-warning disasters.^{1,2} In accordance with these guidelines, as well as local CA-6 Disaster Management Assistance Team (DMAT) and mass casualty incident (MCI) policy, San Francisco County adopted an all-hazards approach to standardize emergency medical and trauma supplies that will be utilized in a disaster or MCI scenario (see [Supplementary material](#)). Twenty-five mobile containers of medical equipment and supplies were distributed to San Francisco Fire Department Emergency Medical Service (EMS) providers and Department of Public Health (DPH) critical access clinics in the community in the early 2000s. In early 2020, response to the coronavirus disease (COVID-19) pandemic revealed gaps in both medical supply quality and personnel training and familiarity, resulting in barriers to developing emergency medical care infrastructure to meet demand for care. In response, the San Francisco DPH EMS Agency began reexamining county disaster supply caches as well as reimagining hospital and EMS system decompression protocols.

The development of mobile, rapidly deployable medical and trauma supplies, medications, and personnel, collectively termed “Project RESPOND” (Rapid Emergency Supplies for Prehospital Operations in Disaster) seeks to bridge this gap in patient care infrastructure during early disaster response. Further, Project RESPOND enhances the capacity for EMS system offloading by creating a novel capacity for the treatment and safe discharge of patients with minor injuries from the scene of an event without necessitating contact with the 911 or hospital emergency care system. Project RESPOND capabilities were designed to include Advanced Life Support/Stabilization tools for a small number of high-acuity illness/injury patients and a large number of lower-acuity patients. Herein, we describe the development of Project RESPOND supply caches and policy changes to support this new capacity.

Project RESPOND Resource Development

Building off guidelines for the level of care provided by the DMAT Mobile Lifesaving Kit, an interdisciplinary team evaluated the utility of existing medical equipment in disaster supply caches. Inventory changes were made in accordance with the scope of practice of and current training and stocking of medical equipment familiar to county EMS providers. To ensure mobility, packs of supplies were assembled and divided into 4 categories: medical supply packs, trauma supply packs, medication packs, and controlled substance packs. Additional materials identified as necessary for disaster response included portable suction machines and monitor/defibrillators. RESPOND pack final inventories were scaled to meet the San Francisco DPH MCI policy goal of independent operation for up to 72 hours without restocking and treatment of 3–5 high-acuity patients or 50–60 low-acuity patients. Final Project RESPOND material allocation resulted in 16 medical supply packs, 5 trauma supply packs, 3–4 medication packs, 4 controlled substance packs, 4 suction machines, and 4 monitor/defibrillators intended to be deployed as 4 separate sets of materials ([Figure 1](#)).

© The Author(s), 2024. Published by Cambridge University Press on behalf of Society for Disaster Medicine and Public Health, Inc. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

Number of Packs	Type of Pack Deployed
3-4	Medical Supply Pack
1	Trauma Supply Pack
1	Medication Pack
1	Controlled Substance Pack
1	Portable Suction Machine
1	Monitor/Defibrillator

Figure 1. Project RESPOND materials included in 1 deployable set.

Project RESPOND Pack Inventory

Medical supply packs contain airway supplies, including oxygen, basic wound care supplies, IV supplies, trauma stabilization equipment, basic vital sign equipment, and triage equipment. All supplies in the medical supply packs were determined to be within the scope of practice of either an Emergency Medical Technician (EMT) or Paramedic, based on county scope of practice. Personal protective equipment (PPE) was added to the packs to provide additional stores in case of potential supply chain breakdown in future incidents.

Trauma supply packs contain a wider variety of gauze and bandaging materials, splinting materials, and hemorrhage supplies. Trauma packs are designed with additional mobility in mind and include several small, removable compartments to aid in the care of patients who may be difficult to extricate or access.

Medication cases include a wide variety of oral analgesics, resuscitative medications, supplies for wound care, cardiac support medications, inhalational medications, antipsychotics, and gastrointestinal medications. Medications included are within the scope of practice of either a paramedic or physician and are intended to be used with physician supervision. Medications are packaged by dose, allowing patients to take required medications home at discharge.

Controlled substances include medications required for rapid sequence induction intubation, alcohol and opioid withdrawal, and severe pain. Controlled substances are kept in a wearable fanny pack with a protective seal preventing opening prior to use. Controlled substance fanny packs are intended to be worn by the responding physician and are tracked by the patient via an included tracking sheet.

Please see [Supplementary material](#) for detailed diagrams and an itemized equipment list of Project RESPOND Medical and Trauma Supply Pack inventory, as well as a complete list of available medications.

Project RESPOND Recommended Utilization

The goal of Project RESPOND is to provide resources and materials necessary for the early phase of disaster or MCI response while simultaneously offloading the EMS system. Therefore, Project RESPOND is intended to be used shortly after an incident occurs and during the first operational period before more permanent supply lines are established. This is best represented by 3 patient care scenarios: the establishment of field care clinics for acutely ill patients, the support of prepositioned medical resources, and the establishment and resourcing of treatment and discharge areas for patients with minor injuries.

Field Care Clinics

Field care clinics are patient treatment areas outside of a traditional hospital environment. While not a replacement for emergency departments, field care clinics are vital for hospital system offloading, particularly when an incident is prolonged and other means of hospital decompression will not be sufficient to meet patient load.³ Further, a review of field care clinic utilization in San Francisco during the COVID-19 pandemic found that most of the patients who were determined to meet criteria for treatment in the clinics did not require further treatment in the hospital setting.³ When paired with current field care clinic guidelines and policies, Project RESPOND supply packs can be used to stock newly established field care clinics to assist in early phase hospital system offloading.

Support of Prepositioned Medical Resources

Medical personnel and resources are often staged at large gatherings in order to facilitate the rapid response to MCIs as they may develop. Sets of Project RESPOND materials can be deployed to staging areas to support the resourcing of these prepositioned providers should an incident arise. This would allow for the immediate establishment of treatment areas for stabilization of critically ill patients for transport and treatment of patients with more minor injuries. If utilized by prepositioned medical resources, providers will follow MCI policy for the establishment of a minor injury treatment area. Project RESPOND materials not required for patient care can be demobilized at the end of the gathering.

Minor Injury Treatment Areas

During an MCI, the materials contained in Project RESPOND packs can be used to stock treatment areas for patients with minor injuries. As medical stabilization occurs, patients who do not require further workup or treatment can be discharged directly from the treatment area back into the community after being evaluated by a physician. A standardized discharge form, completed by the physician, will be given to patients being discharged from the treatment area and includes medical workup performed, instructions and medications, and return precautions (see [Supplementary material](#)).

Project RESPOND also includes several materials intended for the stabilization of patients who have higher than expected acuity of illness/injury or a deterioration in their condition, such as equipment for endotracheal intubation and needle decompression. Patients who deteriorate medically while in the minor treatment area can be stabilized and transported accordingly as their triage category changes.

Staffing

Project RESPOND staffing requirements for minor injury treatment areas are intended to ensure a streamlined flow of patients while providing adequate support for providers. Some staffing designations are standard to MCI response and have been retained. A team leader should be established to oversee the creation of the treatment area, the construction of a physical space that allows for patient evaluation and care, and to provide accountability for operations. The establishment of the treatment area and the triage

secondary evaluation, and treatment of patients is the responsibility of the paramedics and EMTs assigned to the treatment area. Additional medical personnel, such as nurses and nonemergency-medicine-trained physicians can further act in a patient care capacity.

Additional roles were established to support the new capacities that Project RESPOND introduces. The medication lead person, who can be a provider of any level of training, will be responsible for the medication pack and will track the amount of each medication used, call for resupply when necessary, and will retrieve medications requested by patient care providers to ensure rapid delivery. The discharge and documentation lead person will manage patient flow through the treatment area by ensuring that each patient is accounted for on the treatment area's Disaster Patient Tracking Form, tracking patients who may be eligible for discharge from the scene, and ensuring a discharge form is signed by an advanced practitioner and given to each patient before the patient leaves the area. Finally, the advanced practitioner, an emergency-medicine-trained nurse practitioner or physician, is responsible for the administration and tracking of all controlled substances, can be available to provide patient care guidance, and must evaluate and sign off on all patients discharged from the scene. Please see job action sheets included in [Supplementary material](#).

Providers not familiar with field-based medical care can be oriented using a 15-minute online training video hosted on the San Francisco EMS Agency website Resource Management System. The Concept of Operations document also contains protocols for assessment and treatment of commonly occurring injuries and illnesses based on the National Disaster Medical System/Disaster Medical Assistance Team model.

Relief staffing for Project RESPOND treatment areas can be requested at the end of each operational period via the Emergency Operations Center and can draw on local, state, and federal resources. Additional ground support, such as facilities and provisions for providers, is not included in Project RESPOND materials.

Storage and Deployment

The existing 16 medical supply packs, 5 trauma supply packs, 4 medication packs, 4 controlled substance packs, 4 suction machines, and 4 monitor/defibrillators are in circulation in the city of San Francisco. These 4 sets of Project RESPOND medical and trauma supplies with accompanying suction machines and monitor/defibrillators are kept on San Francisco Fire Department's Mass Casualty Unit vehicle. Medication packs are kept at San Francisco Fire Department Station 49 to ensure adequate quality control. Controlled substance packs are kept with like materials according to the EMS controlled substance plan at a secure location.

In the event of an MCI, if Project RESPOND is determined to be a useful resource, the San Francisco Fire Department will deliver medication packs, suction machines, monitor/defibrillators, and medical and trauma supply packs to staging and treatment areas. Most of the staffing, including a team leader, clinicians, a medication leader, and a discharge and documentation leader, can also be supplied by the San Francisco Fire Department. Advanced practitioners will be contacted by the EMS Agency and transported to a centralized location to access the controlled substance pack. The EMS Agency will then provide transportation to the scene.

While deployed, Project RESPOND equipment can be restocked by contacting the Department of Public Health Departmental Operations Center logistics support. Resupply needs will be met by the San Francisco DPH EMS Agency via mobile cargo trailers.

Maintenance

Project RESPOND packs will be maintained by the San Francisco Fire Department as a part of existing quality control measures. A designee within the department will be responsible for maintaining pack inventory, removing and replacing expired materials, and ensuring the functionality of the monitor/defibrillator and suction units. Materials will be reviewed on a triannual or biannual basis to ensure quality.

Controlled substances will be checked to ensure integrity and expiration dates triannually by San Francisco DPH EMS Agency staff. Medications that will expire in the coming year will be flagged for restocking, with a single reorder of all necessary components coinciding with county funding each fall.

Conclusion and Next Steps

The development of Project RESPOND materials, concept of operations, and systems of longevity have resulted in fully functional materials that are now in circulation within the community. Additional steps are required to ensure that Project RESPOND is a useful addition to county MCI policy and operations. Immediate next steps include training providers in the use of the materials in this new capacity and adding Project RESPOND capability to existing San Francisco Department of Public Health disaster response plans, such as the Facilities Emergency Stabilization and Medically Supported Shelter plans. We also foresee Project RESPOND to be iterative and flexible, necessitating ongoing quality control and alterations in response to changes in provider scope of practice, city and county needs, and stakeholder feedback.

Recommended Training

The materials contained in Project RESPOND packs fall within the scope of practice of EMTs, paramedics, and, in the case of the controlled substances, physicians. However, as a new resource available to providers that introduces a novel disaster protocol in the establishment of minor injury treatment areas with the capacity to discharge patients safely from the scene, familiarity with both the materials and the mission of Project RESPOND is vital to utility. Providers who should be familiar with both the materials and recommended usage of Project RESPOND include EMS personnel including San Francisco Fire Department Chiefs and Rescue Captains, Emergency Medicine trained physicians, and other advanced care providers involved in disaster response.

Provider training should have the capacity to occur in both higher and lower resourced settings. In areas with time or person-power constraints, we recommend the development of a brief training video that covers pack inventory, recommended usage including new capacity for patient discharge from the scene, and other pertinent information per county protocols. This can be paired with a tabletop exercise intended to model the deployment of Project RESPOND materials and the establishment of a minor injury treatment area. A model of this 1-hour training module completed by the San Francisco Fire Department Rescue Captains

resulted in an adequate increase in comfort and familiarity with Project RESPOND.

Whenever possible, however, simulation-based training sessions in disaster response represent the gold standard.⁴ As Project RESPOND represents an additional set of resources and novel capacity, training in the usage of materials can occur in tandem with larger disaster training simulations. We recommend this training include a briefing on Project RESPOND concept of operations, simulated mobilization of resources and establishment of a minor injury treatment area, the treatment and discharge of simulated patients, if available, and demobilization of materials.

Emergency medicine physicians should also be familiar with Project RESPOND and their potential role in patient care, controlled substance tracking, and discharge during an MCI. Physicians who may be called upon to respond to MCIs should be trained annually in their mobilization, familiarized with the controlled substance tracking and discharge protocols, and made comfortable with the minor injury treatment area model.

Ongoing Iteration

As the field of paramedicine evolves, changes are made to both standard equipment and provider scope of practice. As a result of these changes, Project RESPOND should be reviewed to ensure continued utility. Changes made to equipment familiar to prehospital providers, such as a switch from King Airways to i-Gel airways in San Francisco County, should be reflected in pack inventory whenever possible. Similarly, ensuring that the monitor/defibrillator being used is compatible with units used by EMS and hospital providers is vital to both patient flow and safety and interagency collaboration in disaster situations. Standardizing pack inventory in accordance with local protocols has the additional benefit of aligning with material ordering streams within the agency responsible for pack restocking.

Additionally, the scope of practice of providers should be considered in determining or altering pack inventory. For example, suboxone was added to the controlled substance pack as paramedic level providers gained the ability to administer the medication. While not every change in scope of practice should result in changes to Project RESPOND materials, inventory changes that mirror changes that affect patient care to anticipated populations served by the response should be considered.

Further attention will also be paid to resource and inventory allocation. The current Project RESPOND deployment plan utilizes existing resource allocation protocols, requiring the San Francisco Fire Department's Mass Casualty Unit vehicle to deliver sets of materials to each treatment area. As capacity further expands to better meet the demands of disaster and MCI scenarios, attempts will be made to decentralize materials to ensure equitable access in the event of infrastructure collapse.

Discussion

Project RESPOND includes the development of mobile, rapidly deployable disaster response supplies and medications for use in the treatment and safe discharge from the scene of patients with minor injuries. It also involves the changes to disaster policy, ordering of materials, and staffing of disaster scenes. Project RESPOND represents a novel approach to the goal of hospital system offloading and efficient, comprehensive patient care and resource management. The development of the protocol and pack

inventory was determined by existing disaster policy as well as patient population and provider scope of practice. While the concept of on-scene discharge of patients is likely applicable to most urban areas, specific inventory items and guidelines for mobilization and restocking should be determined by local policies and guidelines.

Limitations

Project RESPOND is a pilot study of an introduction of a novel disaster response policy intended to aid in hospital system offloading in MCI. The policy, pack inventory, staffing, and training outlined are tailored to San Francisco County and the patient population therein. While most applicable to other urban areas, Project RESPOND may not meet the specific needs represented by patient populations in other locations. Changes to inventory should be made that represent local policy, scope of practice of prehospital providers, patient population needs, and anticipated disasters. Similarly, the concept of operations of Project RESPOND should be altered to work with local disaster and MCI policy and procedures.

It is important to note that no large MCIs or disasters have occurred while Project RESPOND has been operational. As we cannot predict how the materials will function during an event, no data exist on patient outcomes, nor provider feedback. However, provider feedback elicited during training suggests that EMS personnel support this novel capacity and the mission of Project RESPOND. We plan to examine the operational utility of Project RESPOND in the event that it is mobilized for a future MCI or disaster.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/dmp.2024.84>

Author contributions. SP: Developed Project RESPOND supply caches; assisted in updating the concept of operations for Project RESPOND; wrote, filmed, and edited the orientation video; developed the post-training survey; delivered the training module; analyzed survey responses; and drafted the manuscript.

JFB: Developed Project RESPOND supply caches; updated the concept of operations for Project RESPOND; filmed the orientation video; delivered the training module; and edited the manuscript.

MM: Developed the post-training survey; analyzed survey responses; and edited the manuscript.

Competing interests. None.

References

1. Mace SE, Jones JT, Bern AI. An analysis of Disaster Medical Assistance Team (DMAT) deployments in the United States. *Prehosp Emerg Care.* 2007;11(1):30-35. doi: [10.1080/10903120601023396](https://doi.org/10.1080/10903120601023396)
2. Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (USC), Title 1, Sec. 101-159. Authenticated U.S. Government Information. Published June 12, 2002. Accessed February 21, 2023. <https://www.govinfo.gov/content/pkg/PLAW-107publ188/pdf/PLAW-107publ188.pdf>
3. Berger D, Wong-Castillo J, Seymour R, *et al.* Feasibility and safety of a field care clinic as an alternative ambulance destination during the COVID-19 pandemic. *Int J Paramed.* 2023;1:73-84. doi: [10.56068/AMPO6844](https://doi.org/10.56068/AMPO6844)
4. Small SD, Wuerz RC, Simon R, *et al.* Demonstration of high-fidelity simulation team training for emergency medicine. *Acad Emerg Med.* 1999; 6(4):312-323. doi: [10.1111/j.1553-2712.1999.tb00395.x](https://doi.org/10.1111/j.1553-2712.1999.tb00395.x)