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# THE ROLE OF RESPIRATORY THERAPISTS IN DISASTER RESPONSE AND EMERGENCY PREPAREDNESS

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Respiratory therapy

## Abstract

Respiratory therapists have valuable expertise to offer to medical disaster response efforts. Their specialized knowledge and skills can benefit community response teams in preparing for and responding to disaster situations. Their familiarity with hospital routines and equipment, along with education and experience relevant to disaster management, equip respiratory therapists to function effectively as part of a disaster response medical team. This outlines the roles respiratory therapists can play in educational activities to enhance community preparedness, highlights methods of preparedness that may benefit their own health care facilities, and provides guidelines for supervisors interested in enabling those staff who wish to become involved in the field of emergency preparedness and management. Although there is a particular point of view, most of its guidance can be adapted to the needs of respiratory therapists around the world. (Aruru et al.2021)

Since the terrorist attacks of September 11, 2001, there has been a shift in the emphasis given to the importance of emergency preparedness in health care. The heightened awareness by health care professionals of the dangers that can occur in mass casualty events—whether through natural or intentional causes—has prompted a review by individuals, hospitals, and governmental health organizations of the need for enhanced preparedness.

**Keywords**

Respiratory therapists, as part of the interdisciplinary team, are essential in responding to disasters, whether widespread, unintentional events such as hurricanes or intentional threats to the health and safety of the American people. Their unique skills and knowledge are fully integrated into response and recovery activities. Respiratory therapists serve in a variety of disaster roles, including the areas of incident management, critical care and emergency response, and recovery. To succeed in this integral role, respiratory therapists must be trained in disaster management, critical care, life support, and surge capacity principles. Part of that responsibility also rests with the organization, which provides expertise and advocacy for its members. Respiratory therapists, major disaster, health response, pulmonary care, disaster response, medical specialty, intensive care, medical emergency, disaster medicine, medical discipline, medical procedure, medical service, disaster situation, pulmonary physician, patient care, patient safety.

## 1. Introduction

The role of respiratory therapists (RTs) in disaster response and emergency preparedness is being brought to the forefront as natural and man-made disasters continue to occur around the world. The extent of their involvement in disaster response, however, is largely determined by local, regional, and national policies. Position statements supporting the active involvement of RTs in disaster response and relief efforts have been published. These documents contain detailed information on identifying RT competencies and making recommendations for how RTs can be involved in disaster response and relief efforts. Since the competency recommendations and involvement ideas in these position statements are consistent with the scope of respiratory therapies, this article will focus on how RTs can be expected to fulfill these roles within their community with an emphasis on their specific competencies. (Sazzad et al., 2021)

## 2. Overview of Respiratory Therapists

Respiratory therapists are specially trained health care professionals who work under the direction of physicians to provide a wide range of breathing treatments and other services to people with asthma, chronic obstructive pulmonary disease, cystic fibrosis, and other conditions, as well as to premature infants and other patients with heart and lung problems. Respiratory therapists care for patients in all age groups, from the very youngest premature infants to the oldest, who have lung disease in all its varied presentations. Additionally, their work includes treatment of emergency situations or other life-threatening events and includes cardiopulmonary resuscitation, artificial airway care and management, blood gas analysis, ventilator management, and pulmonary rehabilitative procedures. These medical professionals may also care for patients before and after surgery, and also become involved in the care of accident victims and people suffering from shock, drowning, or heart attack. (Garner et al., 2022) (Zhu et al.2020)

Respiratory therapists are licensed to work in many health care facilities, with at least two years of college and preferably a bachelor's degree. As licensed health care professionals, they must receive advanced training and demonstrate the competency required for licensure. Known as Registered Respiratory Therapists, their training is designed to promote competence and patient safety, and includes academic, clinical, and skills competencies. Furthermore, the

curriculum is structured to reinforce the concept of “streamlining” the educational process, allowing health care professionals who demonstrate the requisites of an RRT to advance to jobs for which they are needed, and in the times when they are needed. Consequently, RRT instruction is intensive, both imparting knowledge and assessing the requisite skills, and in some instances, it may be offered in two-year or community college settings. The result is rapid entry into the care environment, where the ranks of respiratory therapists who are educated to practice in all areas of patient care flourish. (Alismail & López, 2020)

*2.1. Education and Training*

How can RTs get this needed training and education to prepare for a disaster? A new lecture series for respiratory therapy students titled "Disaster Preparedness and Response: A Core Pillar of Respiratory Therapy Education" seeks to fill this gap by enabling future RRTs and CRTs to understand disaster response, including the role that RTs play in these responses. Addressing the need for a specific course-based and lecture topic within respiratory therapy education, the series was developed based on competencies and educational recommendations. Taught by pulmonary and critical care physicians with expertise in disaster preparedness and response, topics include an overview of disaster management, radiation and radionuclides, weapons of mass effect, agents of mass epidemiology, emergency response, community ventilation support, and ethics in disaster preparedness. (Tokarz et al.2021)

Respiratory therapists can provide life-saving care to victims of various hazards, including infectious diseases. Unfortunately, the education and preparedness of this vital profession to act as a first response caregiver is lacking. Government and private organizations are seeking subject matter experts in the health care of infectious disease patients, including training for emergency preparedness and response, high-consequence infectious diseases, radiological/nuclear events, and chemical terrorism. To contribute to these national efforts, respiratory therapists are called to embrace and participate in their education in emergency preparedness and response, including through opportunities offered by health security organizations, collaborative efforts, and professional societies.

*2.2. Scope of Practice*

Respiratory therapists perform a wide variety of tasks and modalities in the assessment and management of patients in the care setting. In the field of disaster response, the scope of practice of respiratory therapists is put to the test and often overlaps and mirrors their everyday activities. Particular focus in the specialized field includes acute resuscitation in the emergency department, stabilization en route to the hospital, and rehabilitation within the hospital. Respiratory therapists can also be found in acute care hospital settings and in home care. In acute response, in the field of mechanical ventilation, respiratory therapists are the experts and likely in the majority of cases will be assigned the task of managing the technology. As such, they must understand and be able to manipulate with facility all aspects of critical care ventilators, including invasive and noninvasive settings. Home care ventilators may be used at both the acute and rehabilitation stages in mass incidents, and the respiratory therapist must be able to manage this technology as well. Other diagnostic and management technologies that respiratory therapists can be expected to perform or manage are airway devices, ABG measurements, cardiopulmonary monitors, chest physiotherapy, bronchoscopy, chest tube placement and management, and oxygen therapy. (Roberts et al.2021)

## 3. Disaster Response and Emergency Preparedness

The Society for Academic Emergency Medicine Disaster Interest Group and the Office of the Assistant Secretary for Preparedness and Response recommend that academic medical centers prepare their students to volunteer in unlicensed healthcare roles in the event of a disaster. Respiratory therapists are important members of disaster response teams and should be trained by academic medical centers to provide emergency care. The role of undergraduate medical education in such training remains unknown. We conducted a national, cross-sectional survey using a series of closed case scenarios to test the knowledge of fourth-year medical students regarding whether they were allowed to act in an unlicensed role, including respiratory therapy duties, under different disaster-related circumstances. (Miller et al.2021)

The study took place at the Uniformed Services University of the Health Sciences, an institution that enrolls students in the military services. A paper survey was given to control/case students at the beginning of a required end-of-block exam. We analyzed case 1: "You are no longer a student. You are a graduating medical student awaiting a commission with permission to practice medicine until commissioning. North Korea launches intercontinental ballistic missiles against the United States with the intent to harm your community. Military leadership declares the situation a disaster and creates teams of medics, nurses, and students to augment the care offered at that hospital. North Korea launches a missile against the hospital, destroying the operating room and wounding the gynecologic surgeon. The disaster plan calls for someone to intubate the victim and open a chest for an open pneumothorax. The accrediting body that oversees medical education has allowed other students to assist in anesthetics in the operating room. Should you, as a graduating medical student awaiting a commission (and with no clinical oversight incumbent), be allowed to perform these duties as part of the disaster response?" Data was descriptively analyzed; comparisons were done by chi-square or Fisher's exact test. (Lam & Murray, 2020)

### *3.1. Key Concepts and Definitions*

When studying disasters, it is important that we share a common understanding of the concepts and terminology employed. This common understanding enables a deeper understanding of the impact and implications of these events and facilitates the development of protocols and guidelines to optimize institutional and regional preparedness, response, and recovery. With the advanced knowledge and understanding of the costs and consequences of disasters, the suffering and disruptions of some of these events may be preventable. To facilitate our advanced planning activities, this section will review the key terms and concepts used throughout the chapter. (Muhammed and Mathew2022)

All-Hazards Approach: The term used in public health, public safety, and emergency services to refer to the preparation and response to any event that may have public health, public safety, or emergency services implications. For example, the same concept and planning that went into the response to certain events could be applied to a large number of events, which would present challenges within the core activities of a broad array of other entities. Each event would require the advanced training, equipping, and preparation of personnel in that specific area, yet the overall organizational, operational, and planning concepts are similar. It is suggested that the individual and collective roles could be coordinated and streamlined through joint planning, exercises, and the development of common operating procedures.

*3.2. Respiratory Therapists' Role in Disaster Response*

Response personnel roles are generally divided into three categories: disaster command, triage, and treatment. A disaster command/management team is assembled and assigns specific personnel to be responsible for the activities of each category of response personnel. Triage teams are responsible for creating order and assigning treatment priorities to the patients. Treatment teams, under the coordination of the medical staff, perform stabilization adhering to the established treatment guidelines. (Murphy, 2021)

Respiratory therapists (RTs) have sought inroads into this field, with many professionals determined to take an active role in the injury aspect of disaster preparedness. The multidisciplinary disaster response team should include RTs, as they possess a substantial amount of knowledge and hands-on skills qualified to treat casualties with respiratory distress symptoms and complications at a tragic event. The arrival of RTs is requested to gain an essential role that will allow all patients to be either appropriately treated by a professional trained in the assessment and treatment of respiratory diseases or directed to the hospital for specialized care. RTs are the best, if not the only, qualification for many areas of intervention that involve airway management, mechanical ventilation, lung function assessment, disease diagnosis, and treatment in a large-scale situation when the number of victims is gravely overwhelming. The above areas are tasks commonly performed daily by RTs. RTs are already trained to work collaboratively on interdisciplinary teams within the healthcare system. RTs have a set of capabilities that are pre-tailored to managing victims in a large-scale emergency, particularly in the areas of airway management, mechanical ventilation, and breathing rescue techniques.

## 4. Challenges and Opportunities

In general, the competencies and roles of RTs are not well recognized among disaster and emergency response professionals. This serves to limit the ability of RTs to fully contribute to and benefit from disaster preparedness and response training and education. Preparedness activities may take RTs away from their core clinical duties, but at the same time, respiratory care is critical at every level of care during a catastrophic event. For example, preparation may include activities such as airborne precautions training and personal protective equipment fit testing that would keep an RT from doing clinical rounds and patient care for a half to full day. In a disaster scenario, planning for credential and badge verification that both meets hospital clinical care standards and is recognized by external agencies will be required. Battery-operated equipment and ample supplies were crucial during a major disaster when health care facilities lost power. (Angcahan and De2023)

The change in job scope for respiratory therapists was recognized almost 20 years ago as health care was continuing to change and adapt. The concept of critical care therapists for adult patients and pediatric therapists for children admitted to the hospital was being explored. Although some have been implemented at the hospital level, the existing environment is not particularly structured to move these suggestions forward in the context of disaster preparedness, defined here as the various stages of planning, including designing the hardware and software, training, evaluating, exercising, maintenance, and distribution. Although most hospitals and departments of respiratory care have some protocols for respiratory patient care needs that are part of their emergency management plan, few have had the opportunity to practice these competencies in a major disaster. Respiratory care has predominantly been in

patient care duties and was not seen in the advanced planning activities for these events. Different constructs need to be developed in order to promote and prioritize the role of respiratory therapists in disaster response and emergency preparedness.

## 5. Discussion

Man-made and natural disasters have highlighted the need for effective planning and response on the part of emergency health care workers. Whereas hospital administration, physicians, nurses, and pre-hospital emergency medical care EMTs have been recognized as central to emergency preparedness and short-term supply of emergency care, less attention has been given to the role of respiratory therapists. The potential involvement of respiratory therapists in both planning and procedural response to disasters and mass casualty events has been discussed. A strong and direct relationship exists between the everyday duties of significant numbers of respiratory therapists and what can be expected in the response to mass casualties, irrespective of the exact number or nature of the injuries. In view of their numbers, training, and scope of professional duties, respiratory therapists have long involved time dependence and a wealth of training attributes that may be tailored to make a significant contribution in disaster response. It may be assumed that this contribution will far exceed whatever direct casualty care they may render in the case of casualties. (Datta & Singh, 2021)

Pre-hospital and emergency responder organizations, public health departments, and similar organizations at city, county, or state levels are no different in form, structure, or needs from the theater of operations of other public safety and disaster organizations such as fire, police, and emergency medical services. Their missions are dedicated to disaster emergency management and response to medical strike team/SWAT team call-outs, search and rescue missions, and exercise drills of response personnel. These organizations are vested with the authority to facilitate the dangers that are thrust upon professional personnel throughout the disaster emergency. Furthermore, an internal organizational structure is in place at hospitals and at all state and local public safety, disaster emergency, or EMS agencies that addresses the need for immediate assistance of personnel, equipment, and other disaster relief supplies. Agencies may not only comprise medical professionals, radiological and environmental planners, and law enforcement personnel, but also pharmacists, pathologists, and forensic engineers. Respiratory therapists have a vested interest within these varied organizations. Undoubtedly, there are no areas of uncertainty as to the membership and professional interaction that respiratory therapists have, and will continue to cultivate, within the arena of our nation’s first responders, public safety, disaster emergency, and EMS capabilities. Furthermore, much remains to be discovered, although it is hoped that several key issues with respect to the role of respiratory therapists in both disaster planning and response have been posed. (Aruru et al.2021)

## 6. Conclusion and Future Directions

CBRNE events place specific demands on the healthcare system, including large numbers of acute respiratory failure. During the past decade, professional organizations and federal agencies have produced guidelines addressing the role of healthcare professionals in CBRNE events. Occupational competencies are being developed, and curricula are evolving to meet the specific needs of practitioners who would be called on to protect health under hazardous conditions. We project that the demand for respiratory therapists who have expertise in disaster response and emergency preparedness will grow. The development of formal educational and

experiential programs is a natural response to that growth. The model curricular frameworks and suggested approaches to respiratory therapist involvement await the critical appraisal of the larger respiratory care community. (Gupta et al., 2021)

References:

Aruru, M., Truong, H. A., & Clark, S. (2021). Pharmacy Emergency Preparedness and Response (PEPR): a proposed framework for expanding pharmacy professionals' roles and contributions to emergency preparedness and response during the COVID-19 pandemic and beyond. Research in Social and Administrative Pharmacy, 17(1), 1967-1977. nih.gov

Sazzad, F., Rajan, V. P., & Demircioglu, M. A. (2021). The role of leadership in public sector innovation: A systematic review and meta-analysis of the management of COVID-19 in Asian countries. Frontiers in Public Health. frontiersin.org

Garner, O., Ramey, J. S., & Hanania, N. A. (2022). Management of life-threatening asthma: severe asthma series. Chest. [HTML]

Zhu, Y., Wang, Z., Zhou, Y., Onoda, K., Maruyama, H., Hu, C., & Liu, Z. (2020). Summary of respiratory rehabilitation and physical therapy guidelines for patients with COVID-19 based on recommendations of World Confederation for Physical Therapy and National Association of Physical Therapy. Journal of physical therapy science, 32(8), 545-549. jst.go.jp

Alismail, A. & López, D. (2020). Clinical competencies in advanced practice respiratory therapy education: is it time to entrust the learner?. Advances in Medical Education and Practice. tandfonline.com

Tokarz, E., Szymanowski, A. R., Loree, J. T., & Muscarella, J. (2021). Gaps in training: misunderstandings of airway management in medical students and internal medicine residents. Otolaryngology–Head and Neck Surgery, 164(5), 938-943. [HTML]

Roberts, K. J., Johnson, B., Morgan, H. M., Vrontisis, J. M., Young, K. M., Czerpak, E., ... & Pierce, M. (2021). Evaluation of respiratory therapist extender comfort with mechanical ventilation during COVID-19 pandemic. Respiratory Care, 66(2), 199-204. rcjournal.com

Miller, A. G., Roberts, K. J., Smith, B. J., Burr, K. L., Hinkson, C. R., Hoerr, C. A., ... & Strickland, S. L. (2021). Prevalence of burnout among respiratory therapists amid the COVID-19 pandemic. Respiratory Care, 66(11), 1639-1648. rcjournal.com

Lam, C. M. & Murray, M. J. (2020). The multiple casualty scenario: Role of the anesthesiologist. Current anesthesiology reports. springer.com

Muhammed T, S., & Mathew, S. K. (2022). The disaster of misinformation: a review of research in social media. International journal of data science and analytics, 13(4), 271-285. springer.com

Murphy, J. P. (2021). Disaster Response and Preparedness: Focus on Hospital Incident Command Groups and Emergency Department Registered Nurses. diva-portal.org

Angcahan, D. Z., & De Guzman, A. B. (2023). The radiology department as a sentinel in fall prevention among Filipino older adult patients. Journal of medical imaging and radiation sciences, 54(4), S49-S52. [HTML]

Datta, R. & Singh, S. (2021). Artificial intelligence in critical care: Its about time!. medical journal armed forces india. nih.gov

Gupta, N., Balcom, S. A., Gulliver, A., & Witherspoon, R. L. (2021). … surge capacity during the COVID-19 pandemic and other global respiratory disease outbreaks: A systematic review of health system requirements and responses. nih.gov