ASPR TRACIE Technical Assistance Request

Request Receipt Date (by ASPR TRACIE): 1 July 2019
Response Date: 3 July 2019; updated 11 June 2024; updated 15 April 2025
Type of TA Request: Standard

Request:

The requestor asked ASPR TRACIE for any guidance, best practices, and lessons learned resources related to the community impacts that widespread and/or prolonged power outages would have on affected residents. This includes individuals receiving medical care and particularly those who rely on power-assisted medical equipment.

The requestor noted that utility providers in California have received authority from the state Public Utilities Commission to turn off electricity to prevent wildfires when the risk is extremely high. Certain gas and electric companies are also widely publicizing the potential for "Public Safety Power Shutoffs" (PSPS) that could impact up to 5.4 million households.

Response:

The ASPR TRACIE Team reviewed existing ASPR TRACIE resources; namely the Populations with Access and Functional Needs, Dialysis Centers, Homecare and Hospice, and Utility Failures Topic Collections. We also conducted an online search for additional relevant materials.

The resources in this document provide guidance, best practices, and lessons learned specific to the impacts of power outages on residents who receive medical care and rely on power-assisted medical equipment.

A list of comprehensively developed Topic Collections can be found here: https://asprtracie.hhs.gov/technical-resources/topic-collection.

The ASPR TRACIE Team would also like to highlight the following resource, which may be particularly useful to this request: **HHS emPOWER Map.** More information about this ASPR-specific program, along with several related resources, are listed in this document.

I. Resources Specific to Power-Assisted Medical Equipment During Power Outages

ADA National Network. (2017). Emergency Power Planning for People Who Use Electricity and Battery-Dependent Assistive Technology and Medical Devices.

This emergency power planning checklist is for people who use electricity and battery dependent assistive technology and medical devices including breathing machines

(respirators, ventilators); power wheelchairs and scooters; and oxygen, suction or home dialysis equipment.

Al-rousan, T., Rubenstein, L.M., Wallace, R.B. (2014). Preparedness for Natural Disasters Among Older US Adults: A Nationwide Survey. American Journal of Public Health. 104(3):506-511.

The authors conducted a study to determine natural disaster preparedness levels among older U.S. adults (aged 50 years or older) and assess factors that may adversely affect health and safety during such incidents. Results indicated that only 34.3% of participants that were interviewed reported that they participated in an educational program or read materials about disaster preparation. Approximately 15% also indicated that they use electrically powered medical devices that might be at risk in a power outage.

ASPR TRACIE. (2021). Durable Medical Equipment in Disasters.

This ASPR TRACIE tip sheet provides information on general durable medical equipment (DME) categories and focuses on electricity-dependent DME that may be affected by disasters and emergencies, including power failures. It also includes information to assist healthcare system preparedness stakeholders plan for populations who rely on DME.

ASPR TRACIE. (2023). Impacts of Planned and Unplanned Power Disruptions on California's Public Health and Medical Systems.

This resource summarizes key takeaways which, in addition to understanding power supply regulations in your jurisdiction, can help healthcare emergency planners prepare facilities, staff, and patients for public safety power shutoffs and outages in general.

ASPR TRACIE. (2023). Utility Failures in Health Care Toolkit.

Utility failures are a major concern for healthcare and may cause substantial harm to patients, staff, and facilities. Threats include infrastructure damage due to natural disasters and other incidents, planned outages to relieve stress on services or prevent other hazards, and malicious acts such as physical and cyber sabotage. It is also important to note the cascading effects a failure of one utility may have on others; more than one utility may fail simultaneously or sequentially. This suite of tip sheets can help healthcare facility managers and emergency planners identify issues to consider when planning for and responding to various types of utility failures.

Choose Energy. (2019). Electricity Emergency Preparedness for Senior Citizens and their Caretakers.

The guidance on this webpage can help older adults and their caretakers plan for, respond to, and recover from power outages.

Complex Child Magazine. (2011). Surviving a Power Outage with Complex Medical Issues.

This article is geared towards parents and caretakers of children who require electricity for complex medical issues and offers tips for coping with power outages.

Cote, E., Peterson, L., Evans, A., and Nil, M. (2023). Advancing Preparedness for Life Support Users During Power Outages.

As power outages increase in frequency and duration, many people who depend on life support and other types of DME will face challenges maintaining the power needed for their equipment. This report describes how a pilot project launched in July 2021 by the Louisiana Department of Health helped minimize risk to medical device users and reduced drain on hospitals, ambulance providers, and shelters during emergencies.

Huff, C. (2021). Growing Power Outages Pose Grave Threat To People Who Need Medical Equipment To Live. National Public Radio (NPR).

The author describes how people who rely on electricity to power medical devices for daily life are affected by increasing power outages associated with natural disasters, highlighting how one ambulance provider responded to more than 50 calls in a two-day period from residents who rely on electricity powered life-sustaining equipment The author notes the benefit of programs such as the federal emPOWER program, which maps where people who rely on medical devices live, to facilitate public health and emergency preparedness and response.

Klinger, C., Landeg, O., and Murray, V. (2014). Power Outages, Extreme Events and Health: A Systematic Review of the Literature from 2011-2012.

The authors identified 20 articles that examined the effects of power outages on health. Table 5 highlights the impacts by category (e.g., hospital, healthcare, community, and public health infrastructure).

Molinari, N.A., Chen, B., Krishna, N., et al. (2017). Who's at Risk When the Power Goes Out? The At-home Electricity-Dependent Population in the United States, 2012. Journal of Public Health Management & Practice. 23(2): 152–159.

The authors of this article conducted a study to estimate the number of employer-sponsored privately insured enrollees by geography, age group, and sex who were medically electricity-dependent and resided at home. Results indicated that as of 2012,

among the 175 million persons covered by employer-sponsored private insurance, that estimated number was 366,619, with a national prevalence of 218.2 per 100,000 covered lives. Prevalence also varied significantly by age group and region, with highest prevalence in individuals 65 years of age or older and in the South and the West of the U.S. Across all insurance types, approximately 685,000 electricity-dependent persons resided at home.

Present, D., Clair, J., Belyaev, S., et al. (2005). Effects of the August 2003 Blackout on the New York City Healthcare Delivery System: A Lesson for Disaster Preparedness. (Abstract only.) Critical Care Medicine, 33 (1): S96-S101.

The authors reviewed citywide emergency medical calls for service, emergency department visits, and hospital admissions after the 2003 power failure in New York City. They found a nearly 200% increase in EMS calls for service from respiratory issues in community-based patients with 37 admissions to a single hospital for device failure and note the need for better disaster preparedness planning for facilities and homebound patients.

U.S. Department of Health and Human Services, Administration for Strategic Preparedness and Response. (2024). HHS emPOWER Map.

This interactive map shows the number of Medicare beneficiaries who are electricity-dependent in a state, territory, county, or ZIP Code. The data can be used to plan, respond, and recover from electricity outages and other disasters in specific geographic regions.

U.S. Department of Health and Human Services, Administration for Strategic Preparedness and Response. (2019). The Department of Health and Human Services emPOWER Program: emPOWERing Communities Through New Practical Applications, Training, Informational Resources, Toolkits, Maps, and Virtual Assistants.

The first speaker provided an overview of emPOWER and highlighted new data, tools, and resources. Subsequent speakers (from Los Angeles County and the Virginia Department of Health) shared their experiences using the tool.

U.S. Department of Health and Human Services, Administration for Strategic Preparedness and Response, emPOWER Program. (2020). Stories from the Field: Wildfires in Los Angeles County, California.

During severe wildfires, Los Angeles County, California, used the emPOWER Emergency Response Outreach Individual Dataset to rapidly conduct outreach to near 40 durable medical equipment (DME) and oxygen suppliers to provide recovery assistance to more than 600 individuals impacted by the historic wildfires. LA County also developed a formal multi-agency LA County-City of LA protocol that rapidly operationalizes data and

supports integrated situational awareness, decision-making and action prior to, during, and after an emergency.

U.S. Food and Drug Administration. (n.d.). Home Use Devices: How to Prepare for and Handle Power Outages for Medical Devices that Require Electricity. (Accessed 4/15/2025.)

This booklet can help those who use electrically-powered medical devices plan for and respond to power outages.

U.S. Food and Drug Administration. (2024). FDA Offers Tips about Medical Devices and Hurricane Disasters.

This website offers guidance on the general safety and operation of medical devices following hurricanes.

U.S. Food and Drug Administration. (2024). Medical Devices Requiring Refrigeration.

Tips for storing common medical devices and other products during and after a power outage are listed on this webpage.

U.S. Food and Drug Administration. (2018). Disposal of Contaminated Devices.

This resource provides tips on checking medical devices for contamination and disposing of contaminated products in order to help pharmacies return to business as soon as possible following flooding or loss of power.

Wyte-Lake, T., Claver, M., Johnson-Koenke, R., et al. (2019). Letter to the Editor. Role of Home-based Care Programs During Hurricanes Harvey, Irma, and Maria. Journal of the American Geriatrics Society. 00:1-2.

The authors examined the experiences of nine Veterans Health Administration (VA) Home Based Primary Care (HBPC) programs in their responses to the fall 2017 Atlantic hurricane season, to include Hurricanes Harvey, Irma, and Maria. From April to July 2018, the authors conducted 34 phone interviews with HBPC leadership and staff. Results indicated that a lack of individual household preparedness is most evident in medically vulnerable populations and among older adults.

Wyte-Lake, T., Claver, M., and Dobalian, A. (2016). Assessing Patients' Disaster Preparedness in Home-Based Primary Care. Gerontology. 62(3):263-74.

The authors conducted 32 semi-structured interviews of VA HBPC program staff to explore “ways in which policy and procedures support routine assessment of disaster preparedness for patients as well as patient education activities.” They found that assessments were incomplete and not standardized across practitioners; not all

practitioners understood how to assign risk for their patients; and health and functional limitations are the primary contributors to patients' lack of preparedness.

Wyte-Lake, T., Claver, M., Dalton, S., and Dobalian, A. (2015). Disaster Planning for Home Health Patients and Providers: A Literature Review of Best Practices. (Abstract only.) Home Health Care Management & Practice. 27(4).

The authors conducted a literature review that examined home healthcare disaster preparedness on three levels: organization, provider, and patient. The results highlighted gaps between best and promising tools and policies and adopted policies and differences in approaches to triage, evaluation, education, and classification between organizations.

Wyte-Lake, T., Claver, M., Der-Martirosian, C. and Davis, D. (2016). Developing a Home-Based Primary Care Disaster Preparedness Toolkit. (Abstract only.) Disaster Medicine and Public Health Preparedness. 11(1): 56-63.

The authors surveyed program managers within the VA HBPC program to assess "the utility of an evidence-based Disaster Preparedness Toolkit" to support patient disaster preparedness. They found that those who most frequently implemented disaster protocols found the toolkit most relevant to their work.

Wyte-Lake, T., Claver, M., Der-Martirosian, C., et al. (2018). Education of Elderly Patients About Emergency Preparedness by Health Care Practitioners. American Journal of Public Health. 108(S3):S207-S208.

This editorial describes the VA HBPC Patient Assessment Tool for Disaster Planning, created to address identified gaps and inconsistencies in how home health patients are educated. The tool is a simple, comprehensive checklist of relevant patient characteristics for review by any practitioner on the care team and provides a list of preparedness education items that should be covered by the practitioner with the patient.

Wyte-Lake, T., Der-Martirosian, C., Claver, M., et al. (2018). Provider Delivery of Emergency Preparedness Education in Home-Based Primary Care. (Abstract only.) Disaster Medicine and Public Health Preparedness. 1-8.

The authors of this article conducted a survey, through evaluation of the HBPC Patient Assessment Tool, to identify the strengths and challenges in supporting the preparedness of patients served by home health programs. During a 3-week period, healthcare practitioners from 10 HBPC programs fielded the tool, and a total of 754 Patient Assessment Tools were returned. Results indicated that the educational item most likely to be addressed was how to activate 911 services (87%), and the item least likely to be covered was information on emergency shelter registration and emergency specialty transportation (44%).