

Tips for Healthcare Facilities: Major Earthquakes & Cascading Events: Potential Health and Medical Implications (Summary)

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This tip sheet summarizes the [ASPR TRACIE](#) document, [Major Earthquakes & Cascading Events: Potential Health and Medical Implications](#), which provides a high-level overview of the potential significant health and medical response and recovery needs facing areas affected by a major earthquake with or without additional cascading events.

Overall Considerations

Earthquakes can significantly damage and disrupt a community's interdependent infrastructure, and can lead to other significant disasters, known as "cascading events." Such cascading events may include tsunamis; leaks from nuclear power stations or releases from hazardous material storage facilities; bridge and dam collapses; and landslides/soil liquefaction that can eradicate access to roads and supplies and/or contribute to power and communication outages.

The potential for negative post-earthquake health effects is great. In addition to new onset health effects (e.g., respiratory; eye irritation; crush injuries/trauma; behavioral health), public health effects such as infectious disease outbreaks and foodborne illness spread may occur. Loss of medical facilities, lack of access to medications, and increased exposure to illness triggers can lead to exacerbation of chronic illness and a surge of patients at facilities that are operational.

Steps Healthcare Facilities Can Take Immediately After an Incident

Following an earthquake, debris in hallways and patient rooms must be cleared to ensure quick evacuation is possible, if necessary. Healthcare organizations should activate their emergency response plans (including the continuity of operations plan [COOP], as needed); account for staff, patients, and visitors (supporting reunification); and assess the safety and operational status of their facilities. Operational status should be reported to partners, in support of area-wide triage and transport planning. All tasks should be completed using pre-established protocols to facilitate rapid and efficient decision-making.

Key Planning Considerations for Healthcare System Partners

- Emergency medical service (EMS) providers should be prepared to administer on-scene triage and trauma care.
- Hospitals and other healthcare providers should be prepared to handle an increase in patients with crush injuries, head injuries, complex fractures, and amputations. Surgical expertise and specialty supplies (e.g., external fixators) will also be needed to treat these injuries.
- Comprehensive communications plans that include redundant strategies and equipment, and detailed use protocols, will mitigate the effects of anticipated outages. Facilities should maintain hard copies of staffing and contact information lists, and consider ways to communicate without electricity or working cellular, VOIP, or land line phones.
- Avoiding hospital emergency evacuation is ideal. External generators, fuel supplies to run them, and back-up water sources (potable and non-potable) are critical to preventing evacuation.
- Ensure staff are available to inspect the building for damage to confirm it is safe for continued use. Pay particular attention to power, water supply, potential gas leaks (due to shifting ground/pipe or conduit damage), and structural integrity. Prepare staff and patients for aftershocks.

- Facilities must be assessed for safe operation before re-occupancy. Work with local emergency management and facility personnel to determine the impact on staff and patient access to the facility (e.g., roadway integrity).
- Evacuation planning should include partial (vertical/horizontal) and full evacuation procedures (including pre-identified patient staging areas); accessible blueprints or drawings in case normal evacuation routes are inaccessible; adequate and accessible evacuation equipment/resources; procedures for evacuating specialty wards and medically vulnerable patients; and clear protocols on working with receiving facilities and maintaining patient records upon movement.
- Transportation planning should include redundancies to account for potential competing obligations on the part of transportation vendors, and strain on ambulance and medical transport companies. Determine if aeromedical providers are still able to participate.
- Healthcare facilities able to remain open or re-open shortly after an earthquake may experience a surge of patients with exacerbated chronic conditions; mental health concerns; illness or injury from clean-up activities; and/or in need of medications. Staffing plans should take these anticipated patient surges into account.
- Memoranda of Understanding and operational protocols reflecting liability, logistical, and financial concerns to share staffing and other resources (e.g., equipment, supplies) with other facilities should be drafted and maintained pre-disaster.
- A comprehensive volunteer and deployed state and federal staff management plan should be developed prior to a disaster and include protocols for requesting, accepting, processing, and credentialing volunteers at state and coalition levels.
- Alternate care sites and crisis standards of care may need to be considered. Virtual medical care may need to be established, not only to address surge, but also to provide care to those unable to get to healthcare facilities due to transportation challenges or unable to be transported to higher level definitive care or specialized care.
- Staffing plans should allot adequate time for employees to: rest/eat, check in with family and friends to be reassured of their safety, and take care of personal needs.
- Couriers and vendors who handle labs and deliver supplies (e.g., linen, food, and fuel) may face access issues due to road closures or security barriers. Staff and EMS providers may be similarly challenged.
- Healthcare facilities in areas affected by earthquakes will likely be forced to operate outside of their normal operating conditions, or even to close. Ensure plans incorporate local, state, and federal statutes accordingly.
- Healthcare facilities must be aware of rules regarding what types of patient information may be shared with caregivers, family members, and authorities and plan for maintaining patient medical records with no power.
- Family reunification and patient tracking must be planned for and actions taken immediately to begin reuniting patients and families. Planners must consider ways to communicate when power is out and traditional communication systems are not available.
- Fatality management plans should account for challenges to death scene investigation, patient identification, decedent transport and storage, and family notification, as well as likely resource constraints.
- Planners should consider the potential longer-term health effects on their community following an earthquake in response and recovery plans, which may result from: extended loss of power and/or water; food safety after power loss or earthquake damage; infectious disease outbreaks in shelters; water contamination; and loss of healthcare facilities and/or providers.

Related ASPR TRACIE Resources

Topic Collections

[Hazard Vulnerability/Risk Assessment](#)
[Natural Disasters](#)
[On-Scene Mass Casualty Triage and Trauma Care](#)
[Responder Safety and Health](#)
[Utility Failures](#)

Other Resources

[Disaster Behavioral Health: Resources at Your Fingertips](#)
[Evaluation of Hazard Vulnerability Assessment Tools](#)
[HIPAA and Disasters: What Emergency Professionals Need to Know](#)