TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Hospital Wildfire Evacuation Considerations

Much of the U.S. is vulnerable to wildfires. In recent years, numerous hospitals have had to consider or complete evacuations of patients and staff due to wildfire activity in their communities. Evacuation may be necessary not only due to direct fire threats but also because of poor air quality from smoke and ash or the indirect effects of public safety power shutoffs.

ASPR TRACIE developed this tip sheet to inform hospital evacuation planning for wildfires based on lessons learned from recent incidents. It is intended to help hospital emergency managers identify key activities to work on with other hospital staff and community partners to improve wildfire evacuation preparedness, response, recovery, and mitigation. Considerations apply to the hospital and its surrounding campus, including any ancillary facilities on the grounds. Links to additional ASPR TRACIE resources are also included for further information.[1]

Lessons Learned from Recent Wildfires and Hospital Evacuations

- Applying Lessons Learned to Hospital Evacuation
- Evacuating and Receiving Patients in the Midst of a Wildfire
- Impacts of Planned and Unplanned Power Disruptions on California's Public Health and Medical Systems
- Recovery in Butte County a Year after the Camp Fire
- The Last Stand: Evacuating a Hospital in the Middle of a Wildfire
- Wildfires and Public Safety Planned Shutoffs: Napa County's Experience
- The Exchange: Issue 6: Evacuating Healthcare Facilities
- The Exchange: Issue 10: Preparing for and Responding to Wildfires and Planned Outages

Related ASPR TRACIE Topic Collections

- Continuity of Operations (COOP)/Business Continuity Planning
- Emergency Operations Plans/ Emergency Management Program
- Hazard Vulnerability/Risk Assessment
- Healthcare Facility Evacuation/Sheltering
- Incident Management
- Natural Disasters, including Air Quality Resources
- Patient Movement, MOCCs, and Tracking
- Recovery Planning
- Responder Safety and Health
- Utility Failures

[1]This tip sheet does not include information on the treatment and management of burn injuries; refer to ASPR TRACIE's Burns Topic Collection for information on those issues.

Preparedness

Most often, the steps taken prior to an incident—in this case, monitoring the local wildfire risk, mitigating campus risks, and updating evacuation planning on a regular basis—have the most impact on the. The following preparedness considerations can help hospitals maintain patient care, continue facility operations and determine when evacuation is necessary, and address staffing needs so they are able to support an evacuation and receive assistance as needed during and after the response.

Develop and sustain a high-functioning emergency management program and business continuity plan.

- ☐ Regularly assess the threat and potential effects of wildfires based on the hospital's hazard vulnerability analysis (HVA) and current conditions, including:
  - Historic and anticipated fire risk
  - Near-term weather forecast
  - Active wildfire activity
  - Fire containment status
  - Watches and warnings related to fires and air quality
  - Nearby healthcare infrastructure at risk for evacuation
- ☐ Develop and exercise wildfire, evacuation, and business continuity plans with staff and local responders.
- ☐ Work with hospital leadership to update and maintain policies and procedures that support successful evacuation.
- ☐ Develop quick response guides, job action sheets, and other resources to assist staff implementing evacuation procedures.
- ☐ Determine thresholds for partial or complete hospital evacuation that consider:
  - Local evacuation orders
  - Proximity of fire lines and rapidity of spread
  - Current and forecasted wind, air quality, and other weather conditions
  - Potential for fire to block ingress/egress routes for staffing, resupply, and evacuation
  - Risk based on adjacent land characteristics (e.g., vegetation, fire breaks)
- ☐ Understand both hospital campus and surrounding community ingress and egress routes and their vulnerabilities.
- ☐ Map out potential evacuation vehicle staging area to maximize space and minimize traffic.
- ☐ Establish/update patient transfer agreements with destination hospitals.
- ☐ Work with local emergency medical services (EMS) to plan for ambulance diversion and estimate time needed to complete evacuation using local resources (understanding that availability during an incident may substantially differ) based on average census for advanced life support (ALS), basic life support (BLS), wheelchair units, and/or buses.
- ☐ Determine staffing and equipment needed for the evacuation buses and other transport vehicles.
- ☐ Identify types of equipment and numbers that would be needed per floor including if elevators are out of service.
  - Acquire or have access to specialized evacuation equipment (e.g., stair chairs, med sleds).
  - Include equipment needed for specific patient populations (e.g., bariatric, neonatal).
  - Maintain equipment and train staff in proper use.
- ☐ Identify indoor locations (on each floor, if practical) that may be used as evacuation staging areas.
- ☐ Consider stocking and maintaining hospital evacuation "go bags."
- ☐ Ensure jurisdictional emergency management agency is aware of staffing needs and allows exceptions to travel limitations due to evacuation advisories and orders.
- ☐ Ensure utility providers and jurisdictional emergency management agency prioritize the hospital for continuation and restoration of services.
- ☐ Standardize pre-incident messages related to wildfires and evacuation to enable consistent communication about hospital status.
- ☐ Participate in a local healthcare coalition (HCC) to build relationships and enable coordinated regional planning with nearby healthcare facilities and public health, emergency management, EMS, and other key community partners.

Understand the hospital's infrastructure and its ability to withstand wildfires and their effects on air quality and utility disruptions. Collaborate with facilities staff to ensure roles and responsibilities are known during a potential or actual evacuation.

- ☐ Determine ability of heating, ventilation, and air conditioning (HVAC) system to filter external air.
- ☐ Determine whether HVAC system can handle higher efficiency filters.
- ☐ Maintain supply of filters for more frequent replacement when wildfires are burning in the area.
- ☐ Supplement filtration at air intake vents, if possible.
- ☐ Consider purchase or lease of air purifiers.
- ☐ Purchase air monitors for portable use inside and outside the hospital.
- ☐ Understand how electrical power and other utilities may be affected by wildfires in the area, including whether public safety power shutoffs are a potential mitigation strategy.
- ☐ Identify operations/functions (both clinical and support functions) that need to be maintained by emergency or standby power and ensure they are connected to backup power sources.
- ☐ Know how to shut down utilities (including natural gas) rapidly and safely in the event of a complete evacuation.
- ☐ Assess and manage vegetation and other combustible materials throughout the hospital campus.
- ☐ Consider installing an external sprinkler system and/or contracting for private fire protection, depending on the degree of risk in the community.

Determine actions needed to ensure continuity of patient care during a potential or actual wildfire evacuation. Collaborate with clinical staff and hospital leadership to establish clear roles and responsibilities.

- ☐ Know your patient census and have the ability to track their location (including from an alternate site or virtually).
- ☐ Ensure basic patient demographics (e.g., name, condition, medications, point of contact) can be printed quickly and accompany patients in the event of evacuation (i.e., "face sheets"). Create a paper record that can be used if printed records are not available.
- ☐ Establish and test process for accessing patient records offsite. For those hospitals that are part of a larger health system, this includes being able to access records from a non-affected facility in the health system.
- ☐ Determine thresholds (e.g., unsafe air quality for surgery, evacuation restrictions impeding patient travel) for canceling/delaying procedures. Consider whether some patient care can be done via telehealth instead.
- ☐ Identify pharmaceutical (e.g., bronchodilators and other medications and supplies needed to treat exacerbations of asthma and COPD) and other supplies (e.g., respirators) that may be needed to treat existing patients or protect staff and patients from being exposed to particulate matter from wildfires. Discuss with vendors their ability to deliver increased quantities of identified products when there is a heightened risk of wildfires.
- ☐ Determine specialty patient groups that may need to be evacuated earlier than others (e.g., patients with conditions that could be exacerbated by poor air quality) or may require more effort to find beds (e.g., premature infants, people receiving inpatient psychiatric care).
- ☐ Develop a process to notify loved ones of patient evacuation and transfer location.
- ☐ Work with public health and emergency management agencies to ensure shelters are prepared to address chronic healthcare needs (e.g., power sources for durable medical equipment) to discourage community members from seeking non-emergency medical care at the hospital during wildfires.

Ensure adequate staff are trained and ready for their evacuation roles. This includes encouraging staff personal preparedness. Collaborate with human resources and other hospital administrative staff (and unions, if applicable) to ensure evacuation roles and responsibilities are clear.

- ☐ Educate staff on wildfire preparedness and facility plans and expectations.
- ☐ Establish a process to reassign staff during and following an evacuation (e.g., evacuate with patients to alternate location, report to a different facility in the health system).
- ☐ Provide staff with guidance on creating/personal evacuation go bags.
- ☐ Ensure staff know where evacuation supplies and equipment are stored, including traffic barriers and/or signage and other items needed outside the facility.
- ☐ Maintain a map of staff addresses/zip codes to assess potential commuting and life safety risks.
- ☐ Maintain staff contact information for notifications and updates, including via phone trees. Ensure staff know where to get updates (e.g., calling a hotline, checking email, going to a website) during an evacuation.
- ☐ Account for staff in affected areas being unable to report to work in the event of road closures/damage.
- ☐ Issue laminated statements confirming healthcare employment that staff can show authorities when navigating evacuation or "no passage" areas on their way to the hospital (without, however, asking staff to enter dangerous areas).
- ☐ Identify locations on campus or nearby with adequate space for rest and hygiene of staff who remain onsite during a nearby wildfire.
- ☐ Determine sources of external staffing in the event supplemental staff is needed due to patient surge or to relieve directly affected staff.
- ☐ Determine support (e.g., financial, mental health, child/older adult/pet care) that staff whose homes and families are affected or who are prevented from returning home due to conditions may require. Ensure staff know how to access the employee assistance program, if offered.

ASPR TRACIE Resources

- Utility Failures in Health Care Toolkit

Other Resources

- AirNow.gov
- ASPR: Geospatial Health Systems
- California Emergency Medical Services Authority (CA EMSA): Incident Planning Guides - Wildland Fire and Evacuation, Shelter-in-Place, and Hospital Abandonment
- California Hospital Association: Hospital Continuity Program Checklist
- EPA: Smoke-Ready Toolbox for Wildfires
- Greater New York Hospital Association: Patient Evacuation Toolkit
- Kaiser Permanente Northern California: Manual for Wildfire: Air Quality Playbook
- Massachusetts Department of Public Health: Hospital Evacuation Toolkit

Response

Safe evacuations take time. Hospitals should begin response actions when wildfire activity in the area has the *potential* to threaten the hospital campus and take additional actions as the likelihood of evacuation increases. In some cases, hospitals may begin evacuation activities but avoid a partial or complete evacuation because of changing conditions. Regular communication through the HCC or directly with response partners can help the hospital determine whether to evacuate (partially or completely) or shelter in place and, if evacuation is needed, when to do so.

When conditions indicate a potential need to evacuate: **Begin pre-evacuation activities, including reviewing plans and mobilizing leadership, communicating with response partners, identifying and alerting transportation assets, maintaining indoor air quality, confirming supplies and equipment are sufficient, and preparing staff and patients for a potential evacuation.**

- ☐ Activate hospital incident command.
- ☐ Monitor alerts and warnings related to fire activity, air quality, and evacuation zones.
- ☐ Maintain liaison with jurisdictional fire authority.
- ☐ Maintain situational awareness of fire location, progression, smoke plumes, weather, utility plans, available EMS assets, and effects on staff.
- ☐ Assess and update evacuation triggers based on current situation. Consider potential traffic concerns that may slow or strand EMS units or other transportation assets providing evacuation support.
- ☐ Monitor indoor and outdoor air quality.
- ☐ Ensure facility can adjust ventilation to mitigate smoke particulate.
- ☐ Ensure the hospital is ready to execute rapid shutdown of facilities in the event of an emergency evacuation in which no personnel will remain onsite due to imminent threat.
- ☐ Keep windows closed.
- ☐ Consider implementing access controls to limit the number of doors where smoke or heat may enter. Keep in mind wind direction and prioritize entrances with double doors.
- ☐ Consider limiting visitors and administrative staff to decrease the number of persons in the facility.
- ☐ Reduce indoor sources (e.g., cooking) of particulate matter.
- ☐ Determine availability of specialty transport (e.g., bariatric, critical care). This includes the hospital's/health system's assets as well as community transportation assets.
- ☐ Determine safe location (virtually or at an alternate site) to continue incident command post-evacuation.
- ☐ Prepare evacuation staging areas inside and outside the hospital.
- ☐ Ensure radios and other communication devices are charged. Have chargers and spare batteries available.
- ☐ Check evacuation supply inventory (including go bags, if using) and replace items as needed.
- ☐ Ensure adequate water, food, and toileting supplies are available while patients wait in staging areas and during evacuation to an alternate location.
- ☐ Consider canceling/limiting procedures.
- ☐ Consider EMS diversion depending on the status of other healthcare facilities in the area.
- ☐ Provide respirators to protect staff and patients from particulate matter when outdoors and limit their time outdoors. Cease surgical procedures and provide respirators to staff and patients when indoor particulate matter exceeds 30mcg/cubic meter (or a threshold established by the hospital/health system).
- ☐ Prepare tracking systems and staff for patient movement.
- ☐ Print patient face sheets and other clinical information for transfer with evacuated patients. Confirm hospital/unit census.
- ☐ Ensure patient medication and other belongings are prepared to move with patients.
- ☐ Inventory portable oxygen tanks and regulators and match them to potential transport needs. Be ready to deploy all portable units to staging areas.
- ☐ Notify patient loved ones of potential evacuation and tell them how to track status updates.
- ☐ Ensure the staff to patient ratio is sufficient to manage evacuation requirements. Consider keeping key interventional/acute surgical staff onsite (including providing housing onsite or adjacent to the facility) to be immediately available in the event an imminent evacuation is needed.
- ☐ Recall additional staff if necessary.
- ☐ Provide just-in-time training, if needed, on specialized equipment.
- ☐ Update staff on facility actions, commute impacts, and resources available for those affected.
- ☐ Consider establishing a hotline for staff information/assistance needs.

When an evacuation is likely: **Continue pre-evacuation activities and begin staging for evacuation.**

- ☐ Maintain regular contact with jurisdictional Emergency Operations Center/EMS agency for updated availability of transportation assets.
- ☐ Consider ambulance diversion to other facilities, if possible.
- ☐ Determine destination hospitals per pre-existing local procedures for evacuating patients.
- ☐ Bag and identify patient belongings for rapid movement.
- ☐ Stage evacuation equipment (e.g., stair chairs, med sleds, NICU vests).
- ☐ Consult with pharmacy about the need to package controlled substances for movement offsite.
- ☐ Activate patient tracking system.
- ☐ Implement plan to ensure smooth patient tracking/management with reunification as an end goal (e.g., establishing a call line, notification of loved ones, etc.).
- ☐ Consider preemptive urgent evacuation of complex patients or those requiring specialized transport.
- ☐ Begin to track evacuation expenses.

When an evacuation is required: **Continue previous activities and commence evacuation of patients and staff, secure facility, and track transport to alternate location(s).**

- ☐ Request adequate transportation assets.
- ☐ Begin moving patients to staging areas.
- ☐ Manage transport vehicle staging area and access/flow of vehicles.
- ☐ Work with on-site security, as available, to ensure physical safety of patients and staff outside of hospital (e.g., maintain flow to minimize vehicle/pedestrian interactions).
- ☐ Limit the time patients and staff are exposed to outdoor air.
- ☐ Ensure patients and staff are using adequate respiratory protection.
- ☐ Keep paperwork and belongings with patients.
- ☐ Ensure positive tracking (patient, mode of transport, destination) for every patient.
- ☐ Consider having supplies rerouted to facilities where patients are being transferred.
- ☐ Forward phones to handle continuing inquiries from patient loved ones and others.
- ☐ Mark doors/floors as they are cleared of patients, staff, and other people on site.
- ☐ Ensure facility is shut down and secured upon departure of last patient.
- ☐ Ensure EMS diversion.
- ☐ In cooperation with emergency management, place traffic barriers or signage at all entrances to hospital campus and roadways commonly used to access the facility.
- ☐ Continue tracking evacuation expenses, including staff time and transport resources.

ASPR TRACIE Resources

- Healthcare Facility Evacuation/Sheltering Topic Collection

Other Resources

- CA EMSA: Incident Response Guides - Wildland Fire and Evacuation, Shelter-in-Place, and Hospital Abandonment
- California Hospital Association: Hospital Demobilization and Recovery Checklist and Hospital Evacuation Plan (Checklist)

Recovery

A hospital evacuation not only has a major impact on the availability of healthcare services in a community but also has major consequences on the financial stability of the hospital and its staff. Recovery activities should begin during the response phase to restore operations as safely and quickly as possible.

Prepare the hospital for reopening.

- ☐ Continue incident command. If possible, delegate recovery planning activities to ensure dedicated attention to this phase.
- ☐ Return facilities and security staff to hospital campus as soon as cleared by jurisdictional authorities. Follow with incident command personnel.
- ☐ Ensure coordination between recovery and continuity of operations activities.
- ☐ Determine priorities to enable restoration of services (e.g., cleaning, disposal of supplies, resupply).
- ☐ Restart air monitoring inside and outside the hospital as practical and needed.
- ☐ Assess damage, including soot deposition.
- ☐ Inventory pharmaceutical and other supplies for destruction.
- ☐ Assess supply chain viability and work with HCC and other partners to address manufacturer and distributor challenges.
- ☐ Account for all staff.
- ☐ Determine "homecoming" events and ongoing staff support needs and resources based on individual and collective impacts.
- ☐ Track costs of cleaning, return of patients, ruined supplies, resupply, and staffing.
- ☐ Communicate operating status with the media and the public.

Plan for the restoration of patient care.

- ☐ Determine timeline to service restoration.
- ☐ Determine if phased reopening of portions of the hospital campus is possible.
- ☐ Determine if alternate care systems/sites are needed.
- ☐ Determine potential to bring evacuated patients back to the hospital as the condition of the facility permits.
- ☐ Connect patients with ongoing services (e.g., oncology, labor and delivery, acute care) based on expected downtime. This includes restoration of telemedicine services.

Address administrative and financial needs to restore operations.

- ☐ Engage state and other regulatory agencies to help assess and provide inspections and certifications required for reopening.
- ☐ Seek payment, reimbursement, and financial support from insurers, state and federal agencies, and other sources of assistance.
- ☐ Manage donations and offers of in-kind services.
- ☐ Conduct an after-action review and incorporate lessons learned in preparedness and mitigation activities.
- ☐ Track progress of key recommendations and corrective actions outlined in improvement plans.

ASPR TRACIE Resources

- Disaster Behavioral Health Self Care for Healthcare Workers Modules
- Healthcare Coalition Recovery Plan Template
- Tips for Retaining and Caring for Staff after a Disaster

Other Resources

- California Hospital Association: Hospital Repopulation After Evacuation Guidelines and Checklist
- Greater New York Hospital Association: Recovery Checklist for Hospitals After a Disaster
- Harvard School of Public Health: Essential Functions and Considerations for Hospital Recovery
- St. Louis Hospital Preparedness Committee: St. Louis Area Regional Hospital Re-Entry Plan

Mitigation

While hospitals cannot eliminate their risk, they can take steps to lessen the impact of wildfires on their campus. Routine activities to increase facility preparedness and reduce common wildfire threats in combination with planned investments based on the hospital's HVA and prior experience can make the hospital more resilient.

Follow promising practices to protect the hospital's infrastructure, including regular maintenance and testing of plans and systems.

- ☐ Maintain HVAC system, including replacement of filters per manufacturer guidelines.
- ☐ Seal gaps in building envelope where smoke may intrude (e.g., around windows, pipes, etc.).
- ☐ Map locations of and maintain accessibility to hydrants, sprinkler systems, standpipes, and other fire protection/suppression systems.
- ☐ Place generators and other outside equipment that support hospital operations in areas free from hazards.
- ☐ Create defensible space around the facility by maintaining a buffer clear of vegetation and other combustible material.

Harden the hospital against wildfire threats.

- ☐ Incorporate lessons learned from previous evacuations (and potential evacuations) in campus repairs or improvements.
- ☐ Work with HCC and other partners to understand evolving risks and contribute to whole community mitigation strategies.
- ☐ Determine eligibility and apply for relevant mitigation grants and loans.
- ☐ Use non-combustible materials when renovating existing structures or planning new construction.
- ☐ Consider installation of external sprinkler systems on the hospital campus.
- ☐ Explore the feasibility of using new and emerging technologies to harden the hospital infrastructure or improve resilience.
- ☐ Ensure utility infrastructure and resilience are considered during the design and construction phases of new healthcare facility builds and renovations.

ASPR TRACIE Resources

- Healthcare Facility Extreme Weather Resilience and Mitigation
- Partnering with the Healthcare Supply Chain During Disasters

Other Resources

- ASHRAE: Planning Framework for Protecting Commercial Building Occupants from Smoke During Wildfire Events
- FEMA: Wildfire Hazard Mitigation Handbook for Public Facilities
- HHS: Climate Resilience for Healthcare Toolkit

Personal/Home Wildfire Preparedness Considerations for Staff

- Ensure adequate home insurance coverage.
- Document home and contents via photos and/or video.
- Maintain an adequate supply of medications, including prescription products.
- Keep chargers available and batteries for cell phones and other devices charged.
- Maintain a supply of respirators and eyewear for smoke protection.
- Consider using air purifiers.
- Plan routes for ingress/egress to work and back home. Plan to evacuate early if routes are limited.
- Establish emergency meeting plan known to all household members if separated or unable to communicate.
- Identify temporary housing options, including staying with loved ones. Consider any pets in planning.
- Create a go bag with key documents, electronics, chargers, and other items.
- Make a list of possessions to take when evacuating.
- Maintain neighbor contact list.
- Sign up for neighborhood listservs, social media groups, and other sources of community information.
- Download apps for weather, public safety, traffic, and other reliable sources of official information.
- Reduce risk by controlling brush and other combustible materials around the home.
- Consider maintaining a landline for reverse 911 or evacuation notifications.
- Obtain a laminated letter/card from employer documenting healthcare worker status for access to restricted areas.
- Review resources available at Ready.gov, especially those for wildfires.

During a Wildfire Emergency

- Monitor fire locations, containment status, and weather conditions.
- Monitor alerts and warnings from jurisdictional authorities.
- Monitor employer communications.
- Monitor road conditions and advisories.
- Adjust evacuation routes and relocation plans based on situation.
- Ensure personal vehicle has a full gas tank/is fully charged. If using public transportation, ensure planned method and route has not changed and adjust plans as needed.
- Be ready to rapidly secure home before evacuating.
- Ensure go bag and key possessions are always accounted for (i.e., take go bag to work if there is a possibility of evacuation zone expanding to include home while on shift).
- Understand support (e.g., housing, food) available from employer.