



DISASTER PREPARATION OF OLDER ADULTS: AN ANNOTATED BIBLIOGRAPHY



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American Society of Health-System Pharmacists. Emergency Preparedness: What Consumers Need to Know to Prepare for an Emergency. 17 April 2005. www.ashp.org

The following are tips for emergency preparation: Keep a list of your medications with you at all times. If you have a medical bracelet, wear it. Keep a 3-5 day supply of medication with you, in labeled containers, at all times. Try to keep medication in an even-temperature area and rotate them regularly. If you take many medications, it may be helpful to sit down with your personal physician to assist in medical planning.

California Department of Aging. (2004). Disaster Assistance Handbook for Area Agencies on Aging, Adult Day Health Care Centers and Multipurpose Senior Centers.

Several factors put seniors at an increased risk during a disaster. Older adults on fixed incomes are more likely to reside in a high risk area, where buildings are older and more likely to suffer damage. Many older adults may also depend on services like Meals on Wheels or some type of in-home care, and an emergency may halt these services for a time. Older adults may also lack the social support network that younger adults enjoy. Additionally, the form of disaster recovery services is not always accessible to those with disabilities. There are 5 levels to the Standardized Emergency Management System (SEMS), which include the field, or emergency personnel like firefighters or police, local government, operational area, region and state government. The emergency operations center is where all decision are coordinated between these five levels. Stages are given for disaster planning for agencies providing assistance following a disaster. Older adults may require the following assistance: emergency response hotlines for information, more hot meals (if without electricity), transportation, care management services, help with home cleanup or appraisal of damage, mental or legal services, respite care or assistance relocating, and assistance in repairing or replacing equipment like eye glasses, wheelchair batteries or hearing aids.

California Service Corps, Office of the Governor. (2006). California Delegation Quarterly Report for Emergency Management and Individuals with Disabilities and the Elderly.

The 1994 Northridge earthquake exposed flaws in the disaster response plan as many of the victims were persons with disabilities. A person with disabilities is defined as “a person with physical or mental ability that substantially limits one or more major life activities or a person with a record of such a physical or mental impairment or a person who is regarded as having such an impairment.” (ADA). This group is diverse in health conditions, equipment used, mobility and other impairments. Each department has designated roles and responsibilities. OES plans and prepares for emergencies that threaten lives, property and the environment. EMSA works with OES to coordinate the proper medical response. DSS works to coordinate temporary shelter and grants to those who loose their property. DHS facilitates public health assistance. DMH helps with the planning and recovery for mental health issues related to disasters. DOR provides advocacy for persons with disabilities. Many improvements are needed in order to better serve persons with disabilities. Curriculum and trainers should be focused on training volunteers for potential disaster relief on the diversity of disabled persons and how to assist persons with disabilities. Disabled populations need more information on how to prepare and how to identify themselves by the support that they would need in a disaster.

Center for Disease Control. Keep Food and Water Safe After a Natural Disaster or Power Outage. 14 April 2007. <http://www.bt.cdc.gov/disasters/floodwater.asp>

Food that should be discarded includes all food that came in contact with flood waters, food that smells or looks abnormal, food that has thawed to 40 degrees F for 2 hours or more, and bottles with a screw lid touched by flood waters. Canned food that came in contact with flood water should be cleaned with bleach. Surfaces where food is going to touch should be sanitized with bleach and allowed to air dry. Water may not be safe to drink, clean with, or bathe in after a disaster. Listed to public safety announcements for information on water safety. If boiled or purified water is unavailable, water may be treated with chlorine tablets, iodine tablets or chlorine bleach (1/8 tsp per gallon). Try to follow hygienic practices like hand washing when possible.

Diabetes Life. Diabetes Care During Natural Disasters. 24 July 2007. www.dlife.com.

In the event of emergencies, make sure that you let all emergency personnel know that you have diabetes, so that they can anticipate any potential complications. Continuous high blood sugar carries a high risk of dehydration, as the body's normal process is to excrete excess sugar in the urine. If the body intake of water is not enough to compensate for the increase in urination, the body becomes dehydrated. This can be a serious concern for persons without access to clean water. Preparing for a disaster should include extra reserves of water for persons with diabetes. For persons taking medication to lower their blood sugar, there is a risk of hypoglycemia. Without blood sugar meters, it may be better to let blood sugar reach slightly higher levels rather than trying to keep levels at normal. Risk of infection, especially to the feet, is a significant concern. For people using insulin, carbohydrates should be limited and fluids should be increased when insulin is unavailable. If you do not have access to your prescription, pharmacies may fill it in an emergency if you can provide an empty pill bottle.

Drug Topics. 24 July 2007. Pharmacies Are Ready for the Next Natural Disaster. 21 May 2007. www.drugtopics.com

A new drug database has been established by David Medvedeff. It is called "In Case of An Emergency Rx" or ICERx (www.icerx.org). Mobile pharmacies have been developed for the purpose of disaster response. Disaster preparation has been a focus of both the California Board of Pharmacy and a National Association Boards of Pharmacy. ICERx has the ability to access information from 75-80% of all prescription records for purposes of disaster response.

Federal Emergency Management Agency. (2004). Are you ready? An in-depth guide to citizen preparedness.

1. Getting informed
 - Assessment of local risk and how to prepare for those risks and how to evacuate
2. Emergency planning and checklists
 - Escape routes, family communications, utility shut off, insurance & vital records, special needs, caring for animals, safety skills.
3. Assemble a Disaster Supplies Kit
 - Where to keep kits and why they're important.

Federal Emergency Management Agency. (2004) Preparing for Disaster for People with Disabilities and Other Special Needs. 1-18.

Why Prepare?
What you need to do
Create a Personal Assessment

- *Daily living*- Personal care, water service, personal care equipment, adaptive feeding devices, electricity-dependent equipment
 - *Getting Around*- Disaster debris, transportation, errands
 - *Evacuation*- Building evacuation and exits, getting help, mobility aids/ ramp access, service animals
1. Get Informed- community hazards, disaster plans, warning systems, assistance programs
 2. Make a plan (with action checklist of things to do before a disaster)
 3. Assemble a Disaster Supplies Kit
 4. Maintain Your Plan: Review, Drills, Restock, Test

Federal Emergency Management Agency. Individuals With Special Needs. 17 April 2007. www.fema.gov

Persons with disabilities may need additional assistance in an emergency. For the visually-impaired, one concern is that sounds in the environment may not mimic normal sounds, confusing the blind person, and/or their guide dog. Hearing impaired persons and persons who do not speak English will be unable to hear warnings on the radio or TV. People with mobility or transportation issues, or mental retardation, may need help getting to a shelter. People with medical conditions need to know the location of multiple facilities where they can go to get their treatment. People with dietary restrictions should always have a safe supply of food on hand. The Alzheimer's Association has a Safe Return Program, where people can register those with dementia.

Fernandez, L., Byard, B., Chien-Chih, B., Benson, S., & Barbera, J. (2002). Frail elderly as Disaster Victims: Emergency Management Strategies. *Prehospital and Disaster Medicine, 17*(2); 67-74.

An elderly person is defined as "a person who is over 65 years of age." Special needs, not age alone, increase frailty. Persons with an increased vulnerability during a disaster are those with physical mobility limitations, an impaired sensory system, pre-existing health problems, and social or psychological problems. Physical mobility limitations, such as difficulty performing ADLs and IADLs, may impair one's ability to duck or move from danger. Sensory problems may limit one's ability to maneuver in the dark or during quick evacuation. Medical conditions may make one more susceptible to certain illnesses or disease that can be brought on by disaster, and they put one at risk if proper medication becomes unavailable. Elderly individuals are less likely to leave their homes for financial reasons or because they do not have people around them to encourage them to live. The elderly are least likely to obtain financial help because of the stigma attached to accepting aid and the concern that aid will put them over the amount of money that they can collect.

Internal Revenue Service (2005). Disaster Losses Kit for Individuals. pp. 1-120.

This document contains all necessary information for reporting losses after a disaster. It would be helpful to identify what information is asked in order to do an inventory of one's assets.

Istre, G., McCoy, M., Osborn, L., Barnard, J., & A. Bolton. (2001). Deaths and Injuries from House Fires. *New England Journal of Medicine, 25*; 1911-1925.

In the U.S. each year, house fires result in the death of over 3000 people and the injury of 17,000 others. In analyses on house fires in Dallas, Texas over one year, findings indicate that African Americans, the elderly and those of low socioeconomic status were most likely to be injured in a house fire. These injuries were from fire flames and smoke only, as falls or other injuries were not included in this figure. Smoke detectors showed a protective factor for injuries, as persons with improperly-functioning smoke detectors were 8.7 times more likely to have an injury. Identifying the populations most at risk for fire-related injury should serve to encourage education and assistance to the poor, the elderly and the African American population to help them better prepare for a fire.

McGuire, L., Ford, E.S., & C. Okoro. (2007). Natural Disasters and older US adults with Disabilities: Implications for Evacuation. *Disasters*, 31(1); 49-55.

In the U.S., disabilities are reported in over 50% of adults aged 65 and older. There is a concern that those persons with disabilities residing in their own homes are at greatest risk during a disaster. The current study analyzed how using the Behavioral Risk Factor Surveillance System (BRFSS) in Louisiana could assist in preparing for a disaster. The BRFSS is a state-based survey system that randomly calls households to assess behaviors linked to morbidity and mortality. In the New Orleans area, of nearly 48,000 persons with disabilities, over half were living in residential neighborhoods, requiring special equipment. Adults living on their own and requiring canes or wheelchairs for mobility assistance are at great risk, as organizations like FEMA ask them to create a self-help network, working under the assumption that this is possible for all adults with disabilities. Another concern is transportation, as not all vehicles have the capacity to transport wheelchairs. Systems like the BRFSS are helpful in determining how many persons would need assistance during a disaster, as simple estimation often does not appear to account for the diversity of need.

Ngo, E. (2001). When Disasters and Age Collide: Reviewing Vulnerability of the Elderly. *Natural Hazards Review*. 80-89.

The vulnerability of the elderly in the event of a disaster has been established. With the elderly population growing, there is added complexity on how to address the diversity of needs in an increasingly diverse population. Specifically, it is challenging to identify whether the elderly are at an increased risk due to the magnitude of the disaster, vulnerability of the elderly themselves, cultural variables or some combination of factors. While diversity of the elderly population prevent conclusive generalizations, several factors have been found consistent in most studies. One finding is that actual loss for the elderly is about equal to actual loss for younger adults during a disaster, but older adults are more likely to be on fixed incomes so that recovery is more difficult. One suggestion is that when measuring disaster loss, we should look at *relative need*, and account for persons means to be used toward recovery. Elderly victims of a disaster have a greater perception of loss than younger adults. Elderly adults are more likely to accept assistance like healthcare and transportation than income assistance, as they see this as welfare. Recent studies have shown that elderly individuals do not show more signs of psychological distress, as previously thought. Morbidity and mortality during disaster in the elderly population varies by physical functioning, as disease increases risk due to slower reaction time and limited mobility.

Office of Emergency Services Planning Section. (2005). State of California Emergency Plan. Hazards.

In the event of an disaster, the Department of Social Services is responsible for mass care and shelter. Department of aging concentrates on special concerns related to the aging population. In the event of an disaster, Department of Health Services is the lead for public health, and EMSA is the lead agency for the medical response. CDSS assesses health concerns once people are placed in shelters. Medical resources may be provided by CNG. Medical facilities and staff may be provided by DVA.

Office of the Governor. 30 Sept. 2005. Governor Schwarzenegger Acts on Legislation to Protect California Consumers. 24 July 2007. <http://gov.ca.gov>

Insurers must provide additional living coverage for up to 2 years to persons whose home is being rebuilt after a fire (SB 2). Victims of a natural disaster may seek living expenses for up to 2 years after a state of emergency is declared (SB 518).

Perry, R.W. & M. K. Lindell. (2003). Preparedness for Emergency Response: Guidelines for the Emergency Planning Process. *Disasters*, 27(4); 336-350.

Since the terrorist attacks of 2001, there has been a global effort to make efforts to plan for future states of emergency. Emergency preparedness is defined as “the readiness of a political jurisdiction to react constructively to threats from the environment in a way that minimizes the negative consequences of impact for the health and safety of individuals and the integrity and functioning of physical structures and systems” (308). Planning and training should be seen as a continual process, as we learn more through evaluation following disaster. Disaster preparation is often driven by 2 goals: identifying hazards and reducing risk. Identifying hazards must include not only the recognition of hazards from previous disasters, but also employment of technology to identify potential hazards of the future. Risk reduction requires that planners identify a level of danger and seek to reduce that level to what is considered an acceptable level of danger. Emergency planning will depend on the level of jurisdiction, as agencies planning for larger areas will require increased expenditures and time. Contrary to popular myths, people in disasters are often able to pull on existing knowledge, making active decisions, rather than wandering aimlessly in the streets. People are more likely to contact relatives than major organizations and looting is rare. With this knowledge, we must plan more effectively for disaster, spending our resources on ways to help people prepare constructively for the way that they are most likely to respond to threat. Planners must be flexible, realizing that at the time of a disaster, events may prevent a single, solitary plan, but may allow for a plan that can change with changing needs. Agencies should be aware of the functions that other agencies provide, so that no duplicating of tasks or confusion of responsibilities takes place. Emergency drills can iron out issues that may arise from plans.

PrepareNow.org. Independent Living Resource Center San Francisco. “Earthquake Tips for People with Disabilities.” 4/5/07. <http://www.preparenow.org>.

Establish a personal support network- Personal support persons will check in on you in the event of an emergency. Hired personal assistants may not be available in the event of a disaster. Items to discuss with support people include the location of emergency supplies, how to contact them in various circumstances, what their needs are as well, and always exchange keys and copies of emergency documents. Make sure they know how to get you out of the house, and know your personal care needs.

Health card- Keep multiple copies of an emergency health card, which should contain information about medications, equipment needed and allergies, in the event that you are unconscious. (see tips for health card construction)

Emergency contact list and documents- Identify people who live 100+ miles from you to serve as the contact for the rest of the family. Also include doctors, utility companies, employers, and equipment vendors. Store this list with other emergency documents in your emergency supply kit. Documents should include: proof of residence, social security, license, bank account, insurance policy, living will, photos of all valuables, family records and emergency device serial numbers. Store in a freezer bag.

Practice- Do self-assessments to determine if you will be able to shut off the necessary utilities, carry your evacuation kit, and operate a fire extinguisher.

Medication & Life Saving - Try to maintain a 7-14 day supply of all medicine. Make copies of your prescriptions to include in your emergency supply kits. Find out from your doctor what medications would be safe to go without, shelf life of medication, and procedures for how to obtain medication in an emergency. Try to obtain a generator for life saving devices and register with your local utility company so they know to prioritize power restoration to you.

Also see:

Tips for Collecting Emergency Documents

Tips for Creating an Emergency Health Information Card

Earthquake Tips for People with Disabilities.

Earthquake Tips for Hearing Impaired

Earthquake Tips for People with Cognitive Disabilities

Earthquake Tips for People with Environmental Illness or Multiple Chemical Sensitivities
Earthquake Tips for People with Mobility Disabilities
Earthquake Tips for People with Communication and Speech Related Disabilities
Earthquake Tips for People with Psychiatric Disabilities

Prezant, D., Clair, J., Belyaev, S., Alleyne, D., Banauch, G., Davitt, M., Vandervoots, K., Kelly, K., Currie, B., & G. Kalkut. (2005). Effects of the August 2003 blackout on the New York City Healthcare Delivery System: A Lesson for Disaster Preparedness. *Critical Medical Care*, 33(1); 96-101.

On August 14, 2003, there was a city-wide power outage in New York City at 4 pm. Previous outages in 1965 and 1970 paved the way for the requirement of back up generators. While a power outage may result from power failure, they may also result from disasters. It is important to consider not only persons in hospitals, but also those persons on life-saving devices living in their homes. The day of the blackout went smoothly with regard to disaster planning and the mobilization of police and fire fighters. On the day of the outage, EMS received 5,299 phone calls. During the power outage, EMS response to life-threatening calls doubled at certain times of the day. Of all of the EMS calls, the most substantial percentage of calls came from those persons on respiratory devices, as many had to be admitted due to exhausting their back-up fuel generator. Had the power not been turned on the following day, it is estimated that respiratory patients would have overloaded the hospitals. Some of the major suggestions from this article included maintaining and regularly checking backup generators at hospitals and care centers, require home-based patients to have generators that can sustain them for at least 24 hours, and develop a registry of persons of respiratory devices.

Seplaki, C.L., Goldman, N., Weinstein, M., & Y. Lin. (2006). Before and After the Chi-Chi Earthquake: Traumatic Events and Depressive Symptoms in an Older Population. *Social Science and Medicine*, 62; 3121-3132.

Data was collected by survey on 1160 individuals who experienced a major earthquake in Taiwan. Findings indicate that persons of low SES, women, and social isolated individuals, as well as persons who received damage to their homes, were among the most depressed individuals following the earthquake. Research has suggested that the elderly (persons over age 70) were less susceptible to psychological distress following an earthquake due to better coping styles (maturation hypothesis), and more experience with trauma (inoculation hypothesis), while older middle aged adults (age 54-70) have more responsibilities in society and with their families to make them more vulnerable psychologically (burden perspective). This study found support for all three suggestions.

Shoaf, K., Nguyen, L., Harvinder, S., & L. Bourque. (1998). Injuries as a Result of California Earthquakes in the past Decade. *Disasters*, 22(3); 218-235.

Each year, “300 natural disasters occur worldwide exacting a human toll of approximately 250,000 lives” (318). Of these, earthquakes take 8,000 lives and result in 26,000 injuries. Many factors relate to risk of injury during an earthquake. Time of day that the earthquake takes place may impact risk. Bedding arrangements may impact risk. For instance, if the earthquake takes place at night and there is some type of structural damage, persons on the top floor do better than persons on the bottom. Being indoors at the time of the quake may increase risk. Finding show that older adults are more likely to be indoors during day time quakes, which may be one factor that puts them at an increased risk on injury during the quake. In the case of an earthquake happening in the evening, like the Northridge earthquake, older age did not predict an increased likelihood of injury. One finding is that securing secondary fixtures like furniture and smart placement of glass of heavy items will decrease one’s risk of injury in an earthquake.

Special Committee on Aging United States Senate. (2006). Safeguarding America's Seniors: What We Can Do To Prepare for National Emergencies.

The National Preparedness System, or NPS, part of the Department of Homeland Security, has the responsibility of preparing people for the threat of disaster. The following are recommendations made for better planning for disaster. When planning, it would be helpful to include social service agencies, like Meals on Wheels, which could provide transportation in the event of an evacuation. Agencies should have specific jobs identified to make evacuation run smoothly. Gerontologists should assist in the planning, to train potential aid workers about the potential frailty of the elderly. Tracking of the needs of elderly individuals should be done by the Federal government and should be accessible at the state and local level upon request. Congress should once again fund programs like Geriatric education centers to promote disaster preparation. Shelter locations should be designated in advance for preparation for special needs. Suggestions to the elderly include identifying what type of disasters are common in one's area, putting together a kit and contact persons, plan transportation and multiple evacuation routes, and even if a person is a part of a registry, they should plan to take care of their own needs for at least 72 hours.

United States Food and Drug Administration. Information Regarding Insulin Storage and Switching Between Products in an Emergency. 4/17/07. www.fda.gov/emergency/insulin.htm

Though refrigerating insulin products helps them to last until the printed expiration date, it is safe to keep insulin unrefrigerated, between 59-86 degrees F, for up to 28 days. The higher the temperature that insulin is exposed to, the less potent it is. When new supplies of insulin become available, unrefrigerated insulin should be discarded. It is best not to switch between insulin products, but some exceptions may be made in an emergency. Short-acting insulins may be substituted for another short-acting insulin, and intermediate or long-acting insulins may be substituted for other intermediate or long-acting insulins. For people using insulin mixes or insulin pumps, if these are unavailable in the event of a disaster, it is best to substitute intermediate or long-acting insulins.

United States Food and Drug Administration. FDA Offers about Medical Devices and Hurricane Disasters. 4/17/07. <http://www.fda.gov/cdrh/emergency/hurricane.html>

General safety- When using oxygen, use battery powered flashlights instead of gas powered. Try to contact a distributor first in the event of damage to that device. Check cords for water damage and devices for pests before use. In the event of a power outage, contact your electric company and fire department of your need for power. When the power comes back on, make sure that you check your device to assure that the setting hasn't changed due to an interruption in power. For devices that require water, it is necessary to boil water or treat it with bleach if there is fear of contamination. Bleach or alcohol may also be used to sterilize an area where medicine is being handled. Know that heat and humidity may impact the effectiveness of certain devices.

United States Food and Drug Administration. Medical Devices That Have Been Exposed to Heat and Humidity. 14 April 2007. <http://www.fda.gov/cdrh/emergency/heathumidity.html>

Read the instructions on medical devices to understand how extreme heat may impact the device. High heat may possibly cause devices to malfunction, decrease shelf life, or reduce the sterility of equipment. If there is concern about how the device is functioning, contact the manufacturer.

United States Food and Drug Administration. Safe Drugs After a Natural Disaster. 4/17/07.
www.fda.gov/cder/emergency/water-refrig.htm

Any drugs exposed to flood or contaminated water should be thrown out. For lifesaving drugs that may not be easily available after a disaster, pills may be inspected. If dry, they may be consumed, but if at all wet, they pose risk of causing disease. Reconstituted drugs must be constructed with bottled water. For most drugs that require refrigeration, if left unrefrigerated, they should be thrown out. If needed to sustain life, these drugs may be consumed, but they will be less potent. If drugs are questionable, contact the Red Cross, poison control or your healthcare provide if possible.

United States Government Accountability Office. 18 May 2006. Disaster Preparedness: Preliminary Observations on the Evacuation of Vulnerable Populations Due to Hurricanes and Other Disasters. Pp.1-13.

While the government may make an order of evacuation during a disaster, health care facilities are exempt from evacuation. Nursing homes, like hospitals, face the problem of determining if they have enough resources to shelter in place or enough safe locations with accommodations for patients needing added assistance. The National Disaster Medical System (NDMS) assists hospitals in evacuations, but does not assist nursing homes. Though this program did assist in some nursing home evacuations during Katrina, it is not designed to do so. Elderly adults often do not have the transportation to evacuate during a disaster, as they are more likely to have disabilities or be of low socioeconomic status. Well-developed local disaster assistance programs often had voluntary registries, but the registry is often limited to a small number of individuals and may be unprepared for a huge surge people registering immediately before a disaster, like a storm, is about to unfold.

United States Government Accountability Office. (2006). Transportation-Disadvantaged Populations: Actions Needed to Clarify Responsibilities and Increase Preparedness for Evacuations. pp. 1-66

Though over 1 million people escaped Hurricane Katrina, over 1300 people died. Many of those who died were elderly, disabled, and/or of very low SES. Persons without transportation are difficult to identify because they are a diverse population of varied circumstances. State officials gravely underestimate transportation disadvantaged populations, and often have poor planning with limited training of evacuation plans. Legal barriers prevent proper collection of information on persons without transportation, and liability concerns reduce the likelihood of lay persons getting involved at the time of a disaster. State and local officials are working to address these issues by conducting studies to better understand the needs of this population at a local level, collaborating with religious and private groups that identify the needs of disadvantaged individuals and match them with persons who could help them in a time of need, mapping those without transportation, training police and fire officials to operate large vehicles, and developing better plans for helping those who end up in shelters following a disaster. Recommendations include revision of the current national plan, funds to train state and local governments, and better identification of persons without means of transportation.

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