PLANNING CONSIDERATIONS FOR PERSONS WITH ACCESS AND FUNCTIONAL NEEDS IN A DISASTER

An Information Paper

PART I: OVERVIEW AND LEGAL

Sharon E. Mace, MD
Constance J. Doyle, MD
Kim Askew, MD
Stuart Bradin, DO
Mark Baker, MD
Madeline M. Joseph, MD
Annalise Sorrentino, MD

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Corresponding Author
Sharon E. Mace, MD
Cleveland Clinic Foundation
Emergency Services Institute
9500 Euclid Ave, E-19
Cleveland, Ohio 44195
maces@ccf.org
(216) 445-4598 (office)
(216) 4454546 (administrative assistant, Kaitlin)
(216) 444-1703 (fax)

ABSTRACT

Although disasters can affect anyone in a given community or region, those with access and functional needs have the highest rates of morbidity and mortality during an emergency or disaster. There are many unique and complex issues that should be considered when planning and caring for these individuals in a disaster situation. Who are these individuals, what specific issues should be addressed when considering these members of the population, and what recommendations can be made to address their unique needs? How can we include them as part of the all-hazard, comprehensive approach to disaster management? The first part of this three-part series identifies who is included in this population and what are the legal considerations that arise in caring for, not only this unique group, but all the members of the community in a disaster. The second part considers evacuation, sheltering, sheltering in place, communication, medical needs, independence, supervision, and transportation (CMIST) with a focus on mental health. The third part deals with the medical aspect of CMIST and with recommendations that may aid disaster responders and planners in caring for these high-risk individuals in a disaster.

OVERVIEW

Disasters disproportionately affect the vulnerable members of our society. (Ringel) (Peek) (Greenough) A large segment of the United States population has disabilities and/or chronic medical conditions that increase their risk for illness, injury and even death following disasters. (Ringel) (Nick) (Maja-Schultz) (Dyer Best practices) (Phillips Ch. 10, 2016) (IS-0368) Indeed, those with disabilities or special health care needs have been overlooked, faced a lack of available resources or even denied resources in a disaster. (Cloyd) (Nick) (Dworkin) (Anderson) They have even been exploited or abused by others. (Cloyd)

Individuals with disabilities or those with access and functional needs represent a particular challenge in a disaster. They cannot be triaged, treated or discharged without considering their particular disabilities, their requisite caregivers, and social situation. (Mace & Fuchs) (Mace & Sharieff) Challenges to communication, medical needs,

independence, supervision, and transportation (CMIST) (Kailes) must be considered in their care, whether their care is in the Emergency Department (ED), in a shelter, or if they are sheltering in place.

Individuals with disabilities who come under the CMIST service definition are targets for improved planning and care under the Emergency Support Function (ESF) section 8 Public Health and Medical Services of the National Response Plan. (Homeland Security)

Emergency physicians should be familiar with the types of individuals with disabilities or those with access and functional needs, also referred to as "vulnerable individuals" or "special healthcare needs" (SHCN) patients, and should be knowledgeable and competent in dealing with any alterations of care that this group of patients may require during disaster situations.

Vulnerable patients; by virtue of unavailability of a caregiver or support services, and/or power outages, and/or water, and/or heat/air conditioning (depending upon the climate), and/or inability to access needed medications, treatments, dialysis, ventilators, suction devices, nebulizers, mechanized wheelchairs, other equipment, oxygen, supplies, feedings, water, etc., and/or lack of any plan for alternative care during the disaster; may come to or be sent to the ED for evaluation whether or not there is a new illness or injury. (Klein) (Stratton) (Prezant) (Cooper) (Greenwald) (Fernandez) (Foster) They may experience an exacerbation of their underlying disease and may experience significant morbidity, and even, mortality should there be an interruption in their medical care and/or in their activities of daily living (ADLs) or instrumental ADLs (IADLs). (Hoyt) (Dostal) (Osaki) (Chou) (Gershon)

Previous disasters, both in the United States and internationally, have documented that in addition to acute illnesses and injuries; chronic or ongoing medical needs; such as: medications, special feedings, dressings/wound care supplies, immunizations, dialysis, respiratory needs: aerosols, oxygen, suction, and airway equipment including aerosol machines, BiPAP, CPAP, ventilators, and sanitation supplies (such as diapers and clean drinkable water) etc. must be addressed. (Broz) (Kleinpeter) (Tanaka) (Dolan) (Faul)

Loss of electrical power can be life threatening and must be addressed in any disaster plan for technology-dependent individuals. (Mace & Doyle) (Mace & Sharieff) (Prezant) (Greenwald) (Fernandez) (Mace & Fuchs) The use of battery backups and generators, with access to gasoline to supply the generators, is essential to provide a source of power when electricity is lost if these patients are to be sheltered in place. The ability to supply auxiliary power for at least several days may be necessary. (Mace & Doyle) (Mace& Sharieff) (Prezant) (Greenwald) (Fernandez) (Mace & Fuchs) and as recent disasters such as Hurricane Maria in Puerto Rico have shown, possibly much longer. (Jacobo)

The Federal Emergency Management Agency's (FEMA) recommendation is that those who are sheltering in place have enough supplies, medicines, equipment and power, if needed, to sustain themselves for a minimum of 3 days since it is estimated that it may take up to 72 hours for emergency responders to reach a the site of a disaster. (Cooper) (FEMA)

Triage of these patients will need additional resources particular to their disability. The elderly, pediatric patients, and patients with multiple disabilities and underlying disease are more vulnerable and have a greater morbidity and mortality in a disaster. (Mace & Sharieff) (Dostal) (Osaki) (Chou) (Gershon) (Tanaka) (Mace & Doyle) (Cloyd) (Benson) (Freidsam) (Kilijanek) (Laditka- resilience) (Markenson)

Individuals with disabilities have fared poorly during disasters, such as Hurricane Katrina and Rita in the United States. Those with mobility problems were unable to walk to a shelter or to public transportation in order to get to a shelter or to evacuate; while others were unable to drive or lacked vehicles or couldn't obtain gasoline and thus, were unable to evacuate to a safer area. (Dwyer) (Nick) (Maja-Schultz) (Bascetta) The "transportation disadvantaged"; because of low income and unable to afford a vehicle, or chose not to drive, as with many elderly individuals; are unable to evacuate in a disaster without the assistance of others. (Bascetta) Many of the elderly and/or homebound with disabilities are unable and/or unwilling to evacuate during a disaster. Thus, "many vulnerable people were stranded while awaiting evacuation assistance". During a disaster, they may be confined to their residence "without electricity, medication, or the ability to communicate with the outside world" (Maja-Schultz) Other at-risk individuals, if they did arrive at a shelter "were refused shelter by unprepared organizations." (Maja-Schultz) They also

"experienced difficulties in accessing emergency services because of preexisting health conditions or vulnerabilities." (Fernandez) (Dostal) (Nick) (Maja-Schultz)

THE GOAL FOR MEDICAL SERVICES DURING A DISASTER

The goal or vision, as stated by the United States Department of Health & Human Services, Office of the Secretary: Office of the Assistant Secretary for Preparedness and Response (ASPR), is "All individuals and communities affected by public health emergencies and disasters shall have access to and receive the public health, behavioral health, and medical services they need, so that they can reestablish the activities of daily life." This includes individuals who are particularly vulnerable or "at-risk" during a disaster. (Dodgen)

WHO IS A VULNERABLE INDIVIDUAL?

There are many individuals who are particularly vulnerable or at-risk during a disaster. (Table 1) Special health care needs (SHCN) individuals are included in this vulnerable or at-risk population. Children with Special Healthcare Needs (CSHCN) has been defined by the American Academy of Pediatrics and the Department of Health and Human Services (DHHS) as children who either have or are at risk for chronic physical, developmental, behavioral or emotional conditions and who require health and related services of a type or amount not usually required by children. (AAP)

It is estimated that about 15.1% of children (< 18 years of age) or approximately 11.2 million children in the United States have special healthcare needs. Nearly one-fourth (23%) of U.S. households with children have at least one child with special health care needs. (US DHHS Chartbook) The incidence of school age children receiving special education services in the United States is about 13% of the total public school enrollment. (National Center for Education Statistics) For adults, ages 16- 64 years, the non-institutionalized population with a disability is reported to be 33.1 million or 11.78% of the total population of the United States. (Kailes) Another report sets the number of SHCN adults (aged 16 to 64 years) with disabilities at over 23 million United States residents or about 12% of the population in the non-pediatric and non-geriatric (e.g. 16 - 64 age) group (Nick) The World Health Organization (WHO) estimates that more than 1 billion people have some type of disability with nearly 200 million having "considerable difficulties in functioning." (World Health Organization)

Moreover, the prevalence of disability is expected to increase in the future for multiple reasons including an aging population with a higher risk of disability in the geriatric population, a worldwide increase in chronic health conditions: e.g. diabetes, cancer, cardiovascular disease, obesity, and mental health disorders, and the increase in morbidity (and mortality) arising from disasters and armed conflicts throughout the world. (World Health Organization)

Disability is a physical or mental impairment that significantly impairs an individual's ability to do the activities of daily living (ADLs). (Peek) (Murray) Sixty percent (59.8%) or 26.5 million of the elderly (age ≥ 65 years of age) and one-third (32.2%) or 77 million of all adults (≥ 18 years of age) have "at least one basic action difficulty or complex activity limitation." (DHHS 2016 chartbook) Moreover, these numbers do not include institutionalized adults. (DHHS – disability) About half (from 45% to 55%) of the elderly (age ≥ 65 years old) have some type of disability. (Huang) (McGuire) (Courtney-Long) Of the geriatric population (age ≥ 65 years of age), 92.2% have at least one chronic medical disease, and nearly one out of five (17.4%) have 4 or more chronic diseases. (Huang) One-fourth (25.4%) have at least one ADL or IADL. (Huang) Overall, nearly one-quarter (22.2%) of the United States population has a disability. (Courtney-Long)

Vulnerable populations include more than the disabled or those with special health care needs. The elderly (age > 65 years) and children/infants (age < 18 years) are also considered at risk or vulnerable individuals. (Mace & Doyle) (Cloyd) (Benson) (Laditka –resilience) (Markenson) (Nick) The elderly often have chronic medical conditions, impaired physical mobility, decreased sensory awareness, and social and economic limitations that increase their vulnerability in a disaster. Particularly high-risk individuals are the frail elderly who have significant physical, cognitive, economic, and psycho-social concerns/problems. (Fernandez) (Cloyd) (Benson) (Dyer) The elderly are more likely to be dead or missing after a disaster than any other age group. In Hurricane Sandy, half of all the deaths

were in the geriatric population (age ≥ 65 years old). (Dostal) In Hurricane Katrina > 70% of all deaths were in the elderly (age ≥ 65 years old) and about half (49%) were age ≥ 75 years old. Although the final figures are not yet available, it is anticipated that a large, disproportionate number of the elderly and/or disabled will account for a majority of deaths in the California wildfires. Consider the scenario of when law enforcement or others, such as neighbors, went, often during the night, to wake up and warn people of the impending wildfires. The elderly often with impaired senses and mobility problems may have been unable to hear the doorbell, or smell the smoke, or see the flames off in the distance until it was too late, and when they finally were aware of the impending danger, because of impaired mobility, were unable to move quickly enough to escape from the flames. (Wash Post) The elderly (age ≥ 65 years old) are 13 % of the United States population and by 2030, one out of five Americans (20%) will be elderly. (Fernandez)

Children and infants are categorized as an at-risk population. (Dodgen) Children have developmental characteristics and anatomic, physiologic and psychological differences from adults that increase their vulnerability in a disaster. (Mace & Doyle) (Mace & Sharieff) (Mace & Fuchs) (Markenson) Physiologic differences in pediatric patients include greater surface area-to-body mass ratio with larger heat losses and a greater difficulty in thermoregulation, higher respiratory rates, and smaller blood volumes with a lesser reserve. Newborns have an immature immune system leading to a greater susceptibility to infection. Their limited cognitive ability may impair their ability to recognize a dangerous situation and their curiosity may lead them toward instead of away from danger. Children's limited motor skills may limit their ability to run or escape from danger.

About one out of five Americans (adults and children) has a mental illness. In children ages 9-21 years of age, 21% have a mental or addictive disorder; In adults, 17.9% have a mental illness (excludes substance abuse and developmental disorders) and 9.4% use illicit drugs. (Baren) (NIMH) (National Institute for Drug Abuse) Following a disaster, not only will those with preexisting mental health illnesses and/or substance abuse problems be impacted and likely experience a worsening of behavioral or mental problems, but also individuals without any prior mental health illness may be affected. Moreover, not only survivors, but also those involved in the rescue and care of the disaster survivors may experience psychological difficulties. Irrespective of the type of disaster (man-made or natural) or terrorist event, there is an increase in mental health illnesses following a disaster/terrorist event. Moreover, psychiatric issues may be present months and years after the disaster or terrorist event. Dealing with mental health issues after a disaster has been identified as a major need for assisting the survivors of a disaster and disaster recovery. (Dodgen) (Peek) (Laditka – providing AJPH 2008) (Caramanica) (Teramoto) (North) (Johnson) (Rios)

Age is one determinant of an individual's psychological response to a disaster. Pediatric patients, especially younger children, may not have developed the ability to cope with a disaster and may not have a "temporal sense" that gives them the ability to comprehend that a disaster is time limited. (Baren) Children with disabilities who are very dependent on their caregivers (usually parents), school and community; children with cognitive deficits, and children with emotional disorders may be greatly distressed by exposure to a disaster and the disruptions caused by a disaster. (Mace & Doyle) (Mace & Sharieff) (Mace & Dolan) (Baren) In adults and children, any number of psychological sequelae can occur following a disaster; ranging from anxiety, apathy, aggression, behavioral disorders, self-injurious behavior, to depression, substance abuse, and posttraumatic stress disorder; and may persist even years later. (Mace & Doyle) (Mace & Sharieff) (Peek) (Miyamoto) (Parmar) (Karz) (Schwartz) (Ozbay) Laditka resilience Prehosp Dis Med 2009) (Caramanica) (Teramoto) (North) (Johnson) (Rios) Early recognition of the harmful psychological sequelae of a disaster and intervention will help mitigate the negative psychological effects of a disaster in both adults and children (Mace & Doyle) (Mace & Sharieff) (Baren)

Pregnant women are also deemed a vulnerable population. The Pandemic and All-Hazards Preparedness Act (PAHPA) delineates "at-risk individuals" as children, pregnant women, senior citizens and other individuals who have needs in the event of a public health emergency, as determined by the Secretary of Health and Human Services. (Dodgen)

The American Medical Association, the American College of Cardiology and the American Heart Association have recently designated obesity as a chronic disease with a focus on the associated comorbidities that are often present in obese individuals; such as diabetes, obstructive sleep apnea (OSA), and cardiovascular disease including

hypertension. (AMA) (Jensen) Obesity is epidemic, not only in the United States, but also worldwide. (Sundborn) Over two-thirds (69.2%) of American adults are obese (35%) or overweight (34.2%) and 18% of American children are obese. (Flegal) (Ogden) (Barnett) Morbidly obese individuals have a diminished lung capacity, often have partial or complete airway obstruction during sleep from their OSA, and may have impairment of respiration and hypoxia when in a supine position especially during sleep. Management of their comorbidities, maintaining an adequate oxygen supply and specific positional requirements, along with having appropriate sized equipment and supplies ranging from transportation needs: bariatric stretchers/wheelchairs, to medical equipment: CPAP, larger BP cuffs, large sized gowns and masks is important in caring for these individuals. (DHHS – obesity)

Also listed by ASPR as individuals who may need additional assistance during a disaster are: persons with disabilities, those living in institutional settings, from diverse cultures with limited English proficiency or are non-English speaking, transportation disadvantaged,chronic medical disorders, or pharmacological dependent. (Dodgen) (Ringel)

Using this broader definition, "at-risk" populations are "any individual, group, or community whose circumstances create barriers to obtaining or understanding information, or the ability to react as the general population." This comprehensive definition beyond the disabled would include anyone who experiences geographic or cultural isolation or suffers from addiction. (Dodgen)

Additional individuals or groups that could be included in the more encompassing definition are the homeless, prisoners, those without vehicles, individuals with special dietary needs, and even single parents. (Bascetta) (Wexler) Using the broader definition gives an estimated special needs population that, depending on the included categories and calculations, is 50% or 70% of the population of the United States. (Kailes) An at-risk individual is anyone who, in addition to their medical needs, has other needs that may interfere with their ability to access or receive medical care or essential support services during a public health emergency. (Kailes) (Ogden)Vulnerable or at-risk individuals, are those with special medical needs, and/or need assistance with the activities of daily living (ADLs) or instrumental ADLs, and/or who may not be able, because of individual, socio-demographic, economic, cultural, and geographic/environmental reasons, to recognize and utilize available essential services during a disaster. (Dodgen)

LEGAL

Legal considerations pertaining to the provision of emergency care in a disaster abound. These include liability and malpractice concerns, reimbursement issues as well as standards of care. These arise at the federal, state or local levels. (Sherman) Compliance with federal legal mandates, such as the Emergency Medical Treatment and Labor Act (EMTALA) (medical screening exam and stabilization) or the Health Insurance Portability Act of 1996 (HIPAA) (patient privacy and information sharing rules) is a challenging and often impossible during a catastrophic event.

It is unclear how these laws apply when a hospital's physical plant is disrupted or not functional, and when care is delivered in an atypical, often austere environment where resources are scarce and caregivers overwhelmed. Legal requirements can be modified and, even waived, as was the case post Katrina when the Department of Health and Human Services (DHHS) issued waiver of penalties for HIPAA privacy provisions that proved impractical in the disaster setting. (Abbott)

If the President has declared a state of emergency under the Stafford Act or National Emergency Act, and the Secretary of Department of Health and Human Services (DHHS) has also declared a public health emergency, the DHHS may waive or modify certain conditions of participation for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP). Reimbursement for care rendered in response to an emergency must be available to states and health care providers and responders. This may be provided to federal agencies, states and individual providers when the President has declared a state of emergency or a major disaster under the Stafford Act. If the event involves a release from a nuclear reactor, funds may be available under the Price Anderson Act. States providing mutual assistance under agreements such as the Emergency Management Assistance Compact (EMAC) may get reimbursement from the receiving state. Funds may be available to hospitals, nursing homes, and other health care providers that participate in Medicare, Medicaid and CHIP. However, rules and rates for reimbursement frequently vary from state to state.

Local governments are the first line of defense in emergencies and are primarily responsible for managing the response to most disasters. As resources are exhausted at the local level, assistance is requested from the next level, such as the State, which then requests Federal assistance. All States have laws that describe the responsibilities of the State government in emergencies and disasters. These laws provide Governors and State agencies with the authority to plan for and carry out the necessary actions to respond to and recover from disasters. State emergency management legislation describes the duties and powers of the governor, whose authority includes the power to declare a state of emergency and to decide when to terminate this declaration.

The authority for Federal involvement in disasters is based on provisions of the Stafford Act. This Act establishes the presidential declaration process for major disasters and emergencies, provides for the implementation of disaster assistance, and sets forth the various disaster assistance programs. FEMA's role is to coordinate the delivery of Federal assistance by managing its own programs and by coordinating disaster assistance from other Federal departments and agencies. (Folitin) The definition of major disaster in the law does not explicitly include or exclude infectious diseases, and past interpretations of the provision's applicability to bioterrorism and naturally occurring infectious diseases have varied. (Lister)

One of the major functions physicians should become familiar with is Emergency Services Function Number 8 (ESF #8), the Health and Medical Services Function. ESF #8 provides assistance to supplement State and Local resources for public health and medical care needs during a disaster. (Folitin)

Volunteer health professionals (VHPs) are essential in emergencies to fill surge capacity and provide medical expertise and personnel support to bolster the response effort. (Hodge 2005) (Rosenbaum) Various federal laws, including the Volunteer Protection Act, are designed to encourage and regulate volunteers, including health professionals (VHP). (Rothstein) Several federal programs address ways to bolster the ranks of health care workers for emergency medical response. These include ensuring civil liability protection for VHPs and establishing a national system to verify licenses and credentials when VHPs volunteer across state lines. While efforts are ongoing among states and on the federal level, uniform systems for the protection and verification of VHPs do not yet exist. (Lister) Through advanced registration at the state level, VHP's can be vetted, counseled, trained and mobilized.

The Health Resources and Services Administration (HRSA), a division of the Department of Health and Human Services (DHHS), has facilitated the creation of advanced registration systems through the emergency system for advance registration of volunteer health professionals (ESAR-VHP) program. Under current guidelines, each state system will include readily available, verifiable and up-to-date information regarding the volunteer's identity, licensing, credentialing and privileging to hospitals/facilities that might need volunteers. Advanced registration systems like ESAR-VHP seek to establish prequalified lists of VHPs who meet quality standards consistent with state licensure laws and professional credentialing standards and facilitate rapid deployment of these volunteers. (Hodge 2005) Although the program is administered by states, and registration is at the state level, information and registration assistance for VHPs can be obtained via a website at ASPR which directs individuals to their specific state online registration.

The Model State Emergency Health Powers Act allows for the suspension of ordinary state regulations, use of available resources to facilitate emergency responses, and expedited powers to manage property and protect people. This includes waiver of state licensing requirements for healthcare providers from other jurisdictions and conferment of some liability protections for those who volunteer. These come into effect only when a formal declaration of emergency is made.

The current legal environment for registration, deployment and use of VHPs during emergencies is complex, lacking clarity, inconsistent, and ambiguous. Wide variability in legal protection for volunteers amongst individual states exists. Some provide liability protection and worker's compensation, others do not. (Hodge 2005) Section 11 of the Uniform Emergency Volunteer Health Practitioners Act provides more comprehensive immunity. Under this section, VHPs are not liable for damage except in the case of willful, wanton, grossly negligent, reckless or criminal conduct. However, this act had been enacted in only 7 states as of Nov 2009. (Rothstein)

Enacted in 1997, the Federal Volunteer Protection Act (FVPA), that extends immunity protections to volunteers affiliated with non-profit organizations provided they do not receive compensation of more than $500 annually. The Federal Tort Claims Act (FTCA) assures that health care professionals who volunteer during a federally declared Homeland Security disaster are protected as long as the individual is considered a federal employee. By extending the definition of a federal employee, the FTCA covers health professionals who register with Emergency Management Assistance Compacts (EMAC) or National Disaster Medical System (NDMS).

The 2006 Public Readiness and Emergency Preparedness (PREP) Act provides immunity to individual providers and entities involved in the development, manufacture, or other use of countermeasures (i.e. vaccines or antibiotics). This requires an emergency declaration from the Secretary of Health and Human Services and only applies to those involved in the delivery of countermeasures only during the declared event. (Hoffman) The PREP Act's limitation on liability is a more extensive restriction on victims' ability to recover than exists in most federal tort reform statutes. However, the PREP Act also establishes, in the U.S. Treasury, a "Covered Countermeasure Process Fund" (CCPF) to compensate those who may be harmed by a covered countermeasure. The fund depends on discretionary appropriations, and saw its first appropriation in response to the H1N1 influenza pandemic. (Lister)

The FVCA is limited because it is available only during a federally declared emergency and provides malpractice coverage through the public liability program but no immunity from liability itself. While these Acts provide some federal liability coverage, no uniform federal law exists that will shield health care volunteers during declared health emergencies.

Good Samaritan laws exist in all 50 states; however, they are narrow in scope, vary among states, and provide protection only for emergency care delivered at the scene of an emergency. Non-emergency care provided by a health care volunteer at a facility following an acute event will likely not be protected. (Hoffman) (Anderson) (AAP liability) Good Samaritan laws do not cover a physician if there is any payment for services or an accusation of gross negligence is made. Malpractice insurance policies may not cover the expanded scope of practice necessitated during a disaster; crossing state and even national boundaries may put this coverage at risk. (AAP liability)

The creation of "crisis" or altered care standards to reduce the legal standard or duty of care for medical responders remains controversial. (Schultz) (Koenig) (Hanfling) The standard of care owed by a physician to a patient is that level of care that would be provided by a reasonably prudent physician in similar circumstances. This general legal standard already reflects potential extenuating circumstances frequently encountered in a disaster- lack of equipment, supplies, staff and resources. (Rothstein) However, defining what a reasonable practitioner would do in a disaster is difficult when access to resources differ even within the same locality. To ensure fair, equitable and consistent provision of limited resources in catastrophic emergencies, practitioners must provide patient care consistent with broader interests of protecting the public's health. Decisions to restrict, limit, or deny care to specific patients may be warranted by communal needs arising from the emergency. (Hodge 2010) During a crisis, when resources are inadequate to meet demand, the physician may have to significantly change practices to accomplish the "greatest good for the greatest number". (Hick)

LEGAL – INDIVIDUALS WITH DISABILITIES

In the United States, individuals with disabilities are entitled to equal access to emergency care. This includes not only access to care rendered in emergency departments and pre-hospital care, but also to evacuation and sheltering. (Phillips) In the United States, there are a number of laws to protect the rights of individuals with disabilities, and those with access and functional needs, to prevent discrimination. (IS-0368) These will be discussed as they relate to disaster management. (Table 2)

The Fair Housing Act of 1968 prohibits housing discrimination on the basis of race, color, religion, sex, disability, familial status, or national origin. This law pertains to all types of housing, whether short term or long term residence and includes domiciles that are used to house individuals displaced by a disaster. This would include shelters that house people temporarily, as well as transitional housing facilities, rentals (both short- and long-term rentals), and manufactured housing.

The Architectural Barriers Act of 1968 requires that any facilities or accommodations designed, built, altered, or leased with federal funds must be accessible to the public. Thus, any facilities or buildings that use federal dollars in part or entirely must be designed and built to be accessible for the disabled. Buildings constructed before the law's enactment are not covered. However, any leases or alterations after the law was enacted are generally included.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 Stafford Act) is the law that allows for federal government assistance when the President of the United States declares a State to be a disaster area. Discrimination during disaster relief and assistance activities is prohibited by the Stafford Act. The Stafford Act applies not only to FEMA (Federal Emergency Management Agency) and personnel performing Federal assistance functions, but also to any other bodies participating in relief operations, including private relief organizations (such as the Red Cross), contractors ,paid personnel, and volunteers.

The Post-Katrina Emergency Management Reform Act of 2006 prohibits discrimination on the basis of race, color, religion, nationality, sex, age, disability, English proficiency, and economic status. Executive Order 13347 (or Individuals with Disabilities in Emergency Preparedness) "established a policy that the Federal government appropriately supports the safety and security of individuals with disabilities impacted by either natural or man-made disasters." Executive Order 13347 also established an Interagency Coordinating Council (ICC) to coordinate the federal response to emergency preparedness related to individuals with disabilities.

The Rehabilitation Act of 1973 prohibits discrimination against any disabled individual. It further mandates that all entities that receive Federal financial assistance must effectively communicate with individuals who have communication disabilities, including vision, hearing and/or cognitive disabilities, that . any new construction or altered facilities meet accessibility standards, and made changes in policies, procedures, practices and structures that reasonable accommodations for individuals with disabilities must be made unless doing so would be an undue administrative and financial burden or necessitate a fundamental alteration in the program. Section 504 of the Rehabilitation Act applies to any entity that receives Federal financial assistance, whether a governmental agency, private organization, or religious entity. Under Section 508 of the Rehabilitation Act, federal electronic and information technology must be accessible to those with disabilities.

The Individuals with Disabilities Education Act (IDEA) of 1968 requires that qualifying students be provided a free and appropriate education that prepares them for further education, employment, and independent living. According to the amended law of 2004, "Special education and related services should be designed to meet the unique learning needs of eligible children with disabilities, preschool through age 21." In a disaster, children with disabilities are required to return to school along with their peers with a continuation of their Individual Education Plan in place.

The Americans with Disabilities Act (ADA) of 1990 and ADA amendments Act of 2008 prohibits discrimination on the basis of disability in employment, state and local government, public accommodations, commercial facilities, transportation, and telecommunications. The definition of disability according to the ADA is an individual who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or a record of such an impairment, or a person who is perceived by others as having such an impairment.

Title II of the ADA Act of 1990 mandates that state and local governments give individuals with disabilities an equal opportunity to benefit from all their programs, services, and activities. Title II requirements include meeting specific architectural standards; ensuring effective communication with individuals with vision, hearing, or speech disabilities; and applying standards of accessibility and non-discrimination to public transportation.

Title III applies to businesses and nonprofit service providers as related to public accommodations, certain courses and examinations, private transportation services and commercial facilities.

Title IV deals with telephone and television access for individuals with hearing and speech disabilities.

FEMA: NATIONAL RESPONSE FRAMEWORK AND THE CMIST APPROACH TO DISABILITIES IN A DISASTER

The Federal Emergency Management Agency (FEMA) in the 2008 National Response Framework (NRF) and the Comprehensive Preparedness Guide 101 implemented the functional needs approach regarding individuals with disabilities in disasters. This has resulted in the Communications, Medical Care, Independence, Supervision and Transportation or CMIST approach to disabilities in a disaster, rather than enumerating specific types of disabilities.

CMIST

This recent approach refers to the functional needs of individuals and categorizes the requirements necessary for functioning into five parts: communication, medical health, functional independence, supervision, and transportation or C-MIST. (Kailes) C-MIST is defined as "Populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures; who have limited English proficiency or are non-English speaking; or who are transportation disadvantaged." (Phillips 2012)

ACKNOWLEDGEMENTS

TABLE 1: PATIENTS WITH ACCESS AND FUNCTIONAL NEEDS: CMIST - COMMUNICATIONS, MEDICAL, INDEPENDENCE, SUPERVISION, TRANSPORTATION IN A DISASTER*

COMMUNICATIONS

Impaired Senses

- Vision-impaired: blind, low-vision, deaf/blind (service dogs, Braille, large print signs)
- Hearing-impaired: deaf, hard of hearing, deaf/blind (sign language, hearing aids)
- Speech: aphasic (written boards/utensils for communications, I pads)
- Smell: lack of or limited smell (unable to smell toxins/poisons)
- Touch: lack of or limited ability to feel dangerous objects (hot, cold, sharp, etc.)

Age Related Communication Issues

- Pediatric patients: infants, preverbal children, toddlers: limited speech/verbal and written communication
- Geriatric: some elderly: post stroke, Alzheimer's, dementia

Geographic, Social, Economic, Cultural, Linguistic Isolation

Geographic: may need radios, other communication devices if phone lines, cell towers are not functioning
- Rural
- Wilderness
- Difficult to access areas

Social: reluctance to listen to communications from authorities and distrust of authorities
- Illegal immigrants
- Formerly incarcerated/prisoners
- Gang members
- Homeless

Economic
- Lack usual communication devises: television, radio, landline phones, mobile devices (such as homeless, poor/disadvantaged), (unable to notify about the disaster via usual devices, methods)

Cultural
- Certain ethnic or social or religious communities
- From diverse cultures: may be dependent on non-typical sources of information: neighbors, family, friends, community members: less dependent on usual communication methods

Linguistic
- Limited English proficiency or are non-English speaking (messages should be in languages spoken in the community, not just in English)

MEDICAL HEALTH

• *Acute illnesses and injuries*: related to the disaster (depends on type of disaster: chemical, biological, radiation, nuclear, explosive) and unrelated to the disaster

• *Chronic illnesses:* diabetes, hypertension, congestive heart failure, COPD, asthma. Acute coronary syndromes, cancer, others

•*Mental health support*: to cope with the disaster

• *Contagious Illnesses***
- Respiratory illnesses: certain pneumonias ("shelter" pneumonia), bronchitis, upper respiratory illnesses
- Gastrointestinal: some infectious gastroenteritis with diarrhea, vomiting
- Dermatologic conditions: bedbugs, scabies

** May be related to conditions in the shelters, e.g. from infections: increased risk if in densely populated shelter in close contact with individuals with contagious diseases, and from lack of sanitation and/or clean drinking water: gastrointestinal disease, generally with diarrhea and vomiting

MEDICAL NEEDS

• *Medications/Pharmacological Dependency*   daily
medications for chronic illnesses and for acute illnesses or injuries

• *Oxygen*

• *Respiratory*

-   Supplies: oxygen delivery devises (nasal cannulas, face masks, trach collars, etc.), suction catheters, sterile saline, tracheostomy tubes, humidification
-   Mechanical devices: aerosol machines, nebulizers, suction machines
-   Noninvasive ventilation (BiPap, CPAP)
-   Mechanical ventilation: ventilators
-   Oxygen: tanks, tubing, masks, nasal cannulas

• *Dialysis*: peritoneal or hemodialysis

•*Monitoring Equipment:* glucometers (blood glucose), sphygmomanometer (blood pressure), others

•*Technology dependent*
- On ventilators
- On noninvasive airway devices: BiPAP, CPAP
- Need for suction
- Mechanized wheelchairs

Specialized Treatments
- Dialysis
- Nebulized aerosol treatments

Specialized Nursing Care
- Tracheostomy care
- Wound care
- Intravenous catheters
- Ostomy care
- Foley catheters
- Central lines

Specialized Services
- Pregnancy/Obstetrical services
- Pediatrics
- Geriatrics

INDEPENDENCE: ACTIVITIES OF DAILY LIVING (ADLs)*

Needs for Daily Living

-Water: safe, clean drinking water and water for bathing
-Nutrition: self-feeding or needs assistance with feeding
- Age appropriate diets: food, special diets, formulas, tube feedings, TPN (total parenteral nutrition)
- Supplies for tube feedings, other support services
-Hygiene/Sanitation: need for soap, bathing supplies, bathroom facilities, diapers, etc.:
-Inability to Do Activities of Daily Living (ADLs) and/or Instrumental ADLs (IADLs) **

Age or Condition
- Geriatric population: frail elderly
- Pediatric population: children and infants
- Pregnancy
- Special health care needs
- Others

* The ADLs are feeding, bathing, dressing, toileting, transferring (walking), and continence.

** Instrumental ADLs: basic house maintenance (cleaning and maintaining the house), managing money, handling transportation (moving within the community: driving or navigating public transport), shopping, preparing meals, using the telephone and other communication devices, taking medications, housework

Those unable to do the ADLs or IADLs depend on others (caregivers) for their ADLs and IADLs. These caregivers may be family, neighbors, friends; or community support services (such as meals on wheels, religious or neighborhood/community support groups); or health care professionals including home health aides, visiting nurses, other support services (physical therapy, occupational therapy, etc. or a combination of these individuals and/or groups.

SUPERVISION

Mental Health/Behavioral Disorders, Intellectual Disorders, Cognitive Disorders

Mental Health
- Mental health illness (preexisting or present before the disaster) (may be worsened by the disaster)
- Mental health illness/psychological dysfunction (precipitated by or secondary to the disaster)
- Behavioral disorders: autism spectrum disorder (ASD), attention deficit disorder (ADD),
  attention deficit hyperactivity disorder (ADHD)

- Substance abuse

Intellectual Disability
- Developmental delay
- Intellectual disability
- Traumatic brain injury (TBI)

Cognitive Disability
- Alzheimer's Disease
- Dementia
- Delirium
- Parkinson's disease

TRANSPORTATION

Mobility Impaired
- Limited mobility: canes, walkers
- Wheel chair bound
- Bedridden

Geographic: difficult to reach individuals/families/communities due to wide dispersion, inaccessible roads, lack of public transportation for evacuation if needed
- Rural
- Wilderness
- Difficult to access areas

Social
- Institutionalized: may need handicapped vehicles and attendants during transport;
nursing homes, long term care facilities, day care facilities
- Prisoners: will need accompanying law enforcement officials
- Gang members
Sex offenders and Pedophiles (social predators)

- Homeless: difficult to locate (no address) and often distrust of authority (may need community or religious members to help communicate the need for evacuation or sheltering, etc.)

Economic
- Transportation disadvantaged: unable to afford a vehicle or purchase gas for vehicle
- Lack usual communication devices: television, radio, land line phones, mobile devices (such as homeless), thus, may not be aware of need for evacuation or sheltering

Geographic
- Rural: lack of public transportation/other conveyances, wide dispersion of those affected, lack accessible roads/airports needed for evacuation or moving to a shelter, shelters located at far distances from their domicile
- Difficult to access areas

* This is not an all-inclusive list but is intended to list some common and/or important examples in the various categories and to give an overview of the many different access and functional

Note: Technology dependent patients, such as those on ventilators, will need alternate source of power, such as battery backup or generator, with the ability to last several days until electrical power is restored if they are to be sheltered in place or if they are transported to a specialty care shelter.

TABLE 2: LAWS IN THE UNITED STATES THAT PERTAIN TO INDIVIDUALS WITH DISABILITIES IN A DISASTER

General Legislation*

• Emergency Medical Treatment and Labor Act (EMTALA): medical screening exam and   stabilization

• Health Insurance Portability and Accountability Act of 1996 (HIPAA): patient privacy and information sharing rules

Legislation Specific to Those with Disabilities

• Fair Housing act of 1968 and Fair Housing Act as Amended in1988

• Architectural Barriers Act of 1968

• Robert T. Stafford Disaster Relief and Emergency Assistance Act (as amended)

• Post Katrina Emergency Management Reform Act of 2006

• Rehabilitation Act of 1973

• Individuals with Disabilities Act (IDEA) of 1975

• Americans with Disabilities (ADA) of 1990 and ADA amendments Act of 2008

* This is not an all-inclusive list but lists the major legislation relevant to disasters and individuals with disabilities in a disaster.

PART II: EVACUATION AND SHELTERING

Sharon E. Mace, MD
Constance J. Doyle, MD
Kim Askew, MD
Stuart Bradin, DO
Mark Baker, MD
Madeline M. Joseph, MD
Annalise Sorrentino, MD

Corresponding Author
Sharon E. Mace, MD
Cleveland Clinic Foundation
Emergency Services Institute
9500 Euclid Ave, E-19
Cleveland, Ohio 44195
maces@ccf.org
(216) 445-4598 (office)
(216) 4454546 (administrative assistant, Kaitlin)
(216) 444-1703 (fax)

ABSTRACT

Although disasters can affect anyone in a given community or region, those with access and functional needs have the highest rates of morbidity and mortality during an emergency or disaster. There are many unique and complex issues that should be considered when dealing with these individuals in a disaster situation. Who are these individuals, what

specific issues should be addressed, and what recommendations can be made in order to address their unique needs? How can we include them as part of the all-hazard, comprehensive approach to disaster management? The first part of this three-part series identifies who is included in this population and what are the legal considerations that arise in caring for not only this unique group, but all of the members of the community in a disaster. The second part considers evacuation, sheltering, and sheltering in place and communication, medical needs, independence, supervision, and transportation (CMIST) with a focus on mental health. The third part deals with the medical aspect of CMIST and with recommendations that may aid disaster responders and planners in caring for these high-risk individuals in a disaster.

EVACUATION OR SHELTERING IN PLACE

Evacuation or shelter in place is a difficult question. (Smith) (Mori) (Fitzgerald) (Dosa 2008) The decision to evacuate or shelter in place ranges from personal decisions by individuals and their families to orders by government officials. Numerous factors go into the decision to evacuate, go to a shelter, or shelter in place, includingthe nature of the event (hurricane vs. radiation event), exposure (actual or projected) to the event, time to prepare for the event, time to evacuate (evacuation time estimates), expected duration of event, healthcare effects of evacuation versus staying, number of population affected and population distribution, feasibility of evacuation (availability of adequate transportation vehicles, available routes for evacuation, jammed and lengthy evacuation routes, etc.), shelter availability and adequacy of shelters, as well as others. (Sorensen)

EVACUATION

Many of the elderly are unable or unwilling to evacuate even when a mandatory evacuation is declared. (Dostal) (Langan) (Perry) When considering older adults, especially institutionalized elderly adults, "when possible, sheltering in place is the preferred approach to coping with disasters as it involves only minor disruptions from the norm." (Adelman)

Some recent literature suggests that evacuation is difficult on the vulnerable patient, especially the frail elderly. (Claver) Transporting patients who are being transferred to an alternative site of care in an evacuation can be difficult at best and is fraught with problems. (Dosa 2012) (Johnson) (Dosa 2007) The transfer itself puts stress on the frail vulnerable patient. Patients may be transported in uncomfortable positions for long distances for many hours without access to water or food or bathroom facilities in buses or other vehicles not always handicapped accessible or with the disabled in mind without adequate environmental temperature control. Traveling in a confined space and living in crowded conditions in a shelter creates risks for contagious infectious diseases. (Kawano) (Nishiyama)

Traveling over jammed and lengthy evacuation routes is problematic. (Henderson) Traveling over roads that may be damaged and are heavy with debris poses risks. (Mori) Evacuation routes blocked with traffic and/or debris may make roads impassable and evacuation impossible and other routes may be closed altogether as with the wildfires in California. (ABC news) (Hogan) In some instances, these conditions contributed to vehicle accidents and even deaths involving the patients who were passengers in the vehicles being used for transportation during the evacuation. (Tanigawa) (Horswell) (Bus –AP) Individuals suffered traumatic injuries en route, (Blanchard) (Greenough) while others even died in their vehicles during transportation or soon after evacuation due to environmental conditions (excessive heat, or hypothermia, depending on the specific conditions), dehydration, and deterioration of underlying medical problems. (Tanigawa) (Rios) (Bus- AP) (Horswell) (Hasegawa) (Bagaria)

Unfortunately, medical information/r records and/or durable medical equipment frequently fails to accompany the patient. (Arrieta) (Deal) Similarly, mobility equipment (such as canes, walkers and wheelchairs) also often fails to accompany the patient. (Jenkins) Daily aids, such as glasses and hearing aids, may not be transported with the patient. (Bame) Medications are frequently left behind and/or patients run out of their existing supply of medications very quickly. (Brodie) (Arrieta) (Deal) (Veenema) (Caillouet) Vulnerable individuals may even become victims of abuse and/or exploitation. (Cloyd)

Safety of evacuees in a shelter and in the community after a disaster has been an issue. (Brodie) (Sloand) Over one in five (22%) of evacuees in a Houston shelter after Hurricane Katrina" reported having been threatened with violence."

(Brodie) There was a dramatic increase in gender-based violence after the 2010 Haiti earthquake when women and girls lost the relative security of their homes and families. (Sloand)

Hastily evacuating inpatients and the elderly on seats of crowded buses in hot "full protective suits" without accompanying medical personnel, food or water for many hours during the evacuation after the Fukushima nuclear accident resulted in scores of patient deaths. (Hasegawa)

The poor living conditions in shelters, often with small crowded uncomfortable spaces, have been cited as a factor in an increased incidence of disease and mortality in evacuees. (Nara) Sleeping on the floor in uncomfortable positions under crowded conditions, potentially exposed to communicable infectious diseases without adequate water, food or personal hygiene, often unnoticed or neglected, and possibly abused, likely contributes to the increased morbidity and mortality reported for elderly and other vulnerable individuals who evacuate to shelters during a disaster. (Ichiseki) (Nomura) (Willoughby) (Dosa 2012) (Cloyd)

If evacuating, these vulnerable individuals leave their familiar surroundings and often are separated from their families, familiar caregivers or health care providers. This creates discomfort and unfamiliarity with their new environment which can worsen their conditions, especially if they have dementia or other mental health conditions. This creates a negative impact on the continuity of care and health outcomes of these individuals. (Castro).

Once these frail, vulnerable individuals arrive at a new facility, they are in unfamiliar surroundings with unfamiliar people, generally without their support systems or known caregivers, usually in crowded living space, exposed to communicable infectious diseases. All too often, they may be without adequate water, food, medications and other equipment or supplies since unfortunately, shelters have not been always adequately stocked or supplied to handle large numbers of evacuees, especially those with access or functional needs. (Dosa 2007) (Dworkin) (Parmar) In some cases, they were even "refused shelter by unprepared organizations. (Nick)

There are studies that indicate morbidity and mortality were higher in facilities that were forced to evacuate with little notice than if they had sheltered in place. (Dosa 2007) (Castro) Dosa 2012) (Blanchard) (Dosa 2008) (Willoughby)

SHELTER IN PLACE

Shelter in place typically refers to protective actions taken by local emergency management officials when a chemical, biological, or radioactive material is released by accidental or intentional means. (Stephens) However, the term has also been used to refer to sheltering in the building an individual occupies (such as school, business, nursing home, private residence, etc.) at the time of a natural disaster/emergency. (Stephens) (ARC) Several factors need to be considered in the preparation to shelter-in-place in the setting of individuals with special healthcare needs. (Stephens) (ARC)

In the preparation phase for shelter-in-place, individuals and organizations must consider the different types of disasters they may be subject to (bioterrorism, natural disasters), the effects of these events on their daily function and how to overcome the challenges these events place on their ability to continue to function. (ARC) However, when these individuals possess characteristics that place them at risk for needing additional needs, then further preparation needs to occur. As described previously, individuals may possess one or multiple characteristics that put them at a higher likelihood of needing additional assistance in a disaster. (Kailes)

Sheltering in place can also be difficult. For the vulnerable individuals who are residing in a long term care (LTC) facility such as a nursing home, the decision or burden of whether to evacuate or shelter in place is usually made by the administrators of the facility , unless, of course, there is a mandatory evacuation. (McGuire)

Most elderly Americans live in a residential setting. (McGuire) For these individuals the decision whether to stay in place or evacuate is influenced by many factors. The first category of reasons for not evacuating involves the inability to evacuate; such as no transportation or gas for a vehicle, no time to evacuate (insufficient notice or failed to receive notice), no financial resources (e.g. lack of money allowing them the option of evacuating) lack of lodging ("nowhere to go"), inability to physically leave or get out of their domicile without assistance, or unable to move a loved one (who is usually bedridden). (Langan) Some individuals tried to evacuate but couldn't because of traffic or impassable

roadways. (Hogan) Other factors in the decision not to evacuate involve fear: fear of no home to return to, of losing personal belongings, of looting, of no place to live, and personal safety; and concerns: desire to protect their home, personal property, livestock and/or pets; and the lack of adequate, uncrowded, safe shelters, especially ones that will care for sick or elderly or vulnerable loved ones. (Hogan) (Langan) The need to work and being unable to be excused from work are also mentioned. The influence of family members or neighbors also has an impact on the decision to stay or evacuate. (Langan) (Hogan) Moreover, in previous disasters, shelters were not uniformly equipped to manage the functional and physical needs of elderly…. even though the county "had a detailed evacuation plan in effect prior to the event." (Dosa 2008)

Sheltering in place has occurred in previous disasters, such as during various hurricanes. (Castro) (Johnson) Sheltering in place can also have tragic consequences. (Langan) (Dosa 2008) After Hurricane Katrina, reports indicated that at least 383 elderly died in their homes, 64 in hospitals and 70 in a nursing homes. (Laditka AJPH 2008) (Langan) (Dosa 2008) In several nursing homes after Hurricane Katrina, home residents that were sheltering in place perished. (Dosa 2008) In some instances, sheltering in place may not be a desirable option, such as with radiation or chemical exposures as with the Chernobyl nuclear accident or the Bhopal chemical disaster. For hazardous chemical releases, the most common decision is for evacuation. (Sorensen) Following nuclear accidents, concern for radiation exposure has generally resulted in evacuation, as following the Fukushima nuclear accident. (Hasegawa) More recently with the extensive wildfires in California there were mandatory evacuations. (Chavez)) In other cases, it may not be possible to evacuate. They may be insufficient or no time for evacuation before the disaster occurs. Or there may be insufficient or lack of evacuation routes, or it may not be feasible to evacuate the large number of people involved, such as with Hurricane Maria that recently devastated Puerto Rico. (Yan -CNN)

If the decision is made to shelter-in-place or to evacuate to a shelter, what then is essential? The basics include food, potable (for drinking) and non-potable water (for toilets), shelter that is protected from the elements (preferably at an environmentally appropriate climate controlled temperature that will help avoid dehydration and heat illnesses if too hot, and conversely cold injuries if extremely cold). (Downey) Other essentials include clothing, personal hygiene supplies, and sanitation. (Laditka PreDisMed 2009) Security should be provided both to shelters and in the affected community to protect the remaining citizens and property, prevent looting, and/or to prevent abuse. (Brodie) (Sloand) (Cloyd) (Narayan)

For those with medical needs, additional supplies include oxygen, medications, mobility equipment (including canes, walkers, crutches, wheelchairs), respiratory equipment (suction, tracheostomy supplies, BiPaP/CPAP, nebulizers), durable medical equipment, personnel aids (such as glasses, hearing aids, etc.), and electrical power for medical equipment such as ventilators, IV pumps, etc. A reliable source of electricity is a major concern. After a disaster, even if there are generators, obtaining fuel (e.g. gasoline) for the generators can be difficult or impossible to obtain. (Narayan) (Resnick)

The lack of personal assistants, whether family, neighbors, friends or health care professionals, who can assist with the activities of daily living (ADLs) is essential to the well- being of vulnerable individuals. Adequate staffing of both personnel (personal assistants or home health aides helping with ADLs, IADLs) as well as those delivering actual medical care is critical for optimal outcomes. (Johnson) (Dosa 2007) (Castro) (Downey)

CMIST CONSIDERATIONS FOR SHELTERING IN PLACE DURING A DISASTER

Communications

Individuals who possess limitations in communication will need additional time in order to process information and manage the situation and its consequences. (whendisasterstrikes) These individuals may not be able to process messages about disasters due to hearing, visual, or cognitive limitations in understanding media messages understood by individuals without the same difficulties. Therefore, individuals with communication impairments who plan to shelter-in-place should ensure they have different means of receiving information about ongoing disasters/emergencies. They should also prepare for ways to communicate with rescuers about their health condition, since in the midst of a disaster rescuers may not have all the capabilities to communicate with them (for example,

written hard copy of medical problems). Disaster planners should ensure they can deliver needed information via different methods of communication, as well as have a list of persons with communication difficulties. There should be methods to ensure that individuals with communication problems understand the location they are to report to when they need to go to a shelter (e.g. central location of assisted living facility, school) prior to the disaster event.. The key to success is ensuring that not just one form of communication is used to provide information, such as visual or audio, as not everyone will be able to comprehend this information and therefore, will be at higher risk.

Medical Care

When thinking of special need populations, the group that generally receives the most attention is those who possess medical conditions that place them at higher risk of needing additional assistance. This population includes people whose medical conditions depend upon electricity, medications, feeding supplies, etc. Individually, persons having medical conditions that place them at risk in a disaster should consider (and obtain) what medical and other supplies (such as food and water) they would need in order to survive or not have worsening symptoms if they are left alone for several days. (Pitt Co) Therefore, individuals should ensure they have enough medications, oxygen, supplies, and skill to survive alone for up to one week. (Pitt Co) They should also inform utility companies and emergency response organizations of their location prior to a disaster and have plans for backup power (such as a generator with a supply of gasoline) if technology dependent.

Independence

The next group of individuals who may require additional consideration when planning to shelter-in-place are those who do not have the ability to function independently. (Kailes) Many individuals require familial assistance in daily activities, or have home health organizations visit daily to assist with care. Individuals should ensure they have all equipment needed to survive for up to three days after an emergency/disaster. This includes batteries, equipment parts, generators, and any other equipment/supplies that the individual is dependent upon. Individuals who require assistance with meals should ensure a supply of food and water prior to the emergency/disaster. Individuals who receive home healthcare services should discuss the availability of these services during differing emergencies prior to making the decision to shelter-in-place. (Pitt Co) Organizations (long term care facilities, such as nursing homes) should ensure food and water supply as well as medical equipment/supplies for several days, while possessing generators to power essential electrical equipment for the care of individuals since it is likely that there will be at least several days without the ability to obtain additional food, water, oxygen, medical equipment/supplies, etc.

Supervision

Individuals who require supervision and are separated from this supervision present a fourth group who requires special thought in preparedness for a disaster. (Kailes) This population may not be able to provide care for themselves during shelter-in-place (their domicile) or at a shelter. Different organizations may provide volunteer services to assist in the care of such individuals when their normal support network is no longer present in a disaster. Individuals and their families should investigate these organizations as part of their preparedness. Some individuals working in certain organizations (e.g. long term care facility or hospitals) during the disaster may present other sheltering needs during a disaster. For example, the children of nursing staff and other employees of a nursing home working during the disaster may not be able to leave their children at home. (Wrightman) Therefore, organizations should consider the need to support the presence of the employees' (or local volunteers') children and other family members, who also may require supervision. Concern for their loved ones and not leaving them alone during the disaster is a major issue that can impact staffing. This can add to the needs and challenges faced by disaster response services.

Transportation

The last at risk group to discuss with special needs are those with limited transportation means. This group includes people in need of assistance in moving from one location to another. Those with impaired mobility who will need assistance to get to the shelter, need adequate staffing to assist in the actual transfer from their domicile to the transportation vehicle and/or to the shelter. An adequate number of handicapped accessible vehicles will also need to be provided.

There are also those who are transportation disadvantaged, d lack a vehicle and/or don't drive so they can't evacuate without transportation being provided.

Often times, a central location is used as the building to shelter-in-place. The location should be easily accessible by all individuals, whether they are able to walk, require a wheelchair, or are bedridden. Individuals should be able to move about within the designated shelter. Therefore, the location should not only be accessible to those with disabilities, but allow for easy movement within the building itself. There are laws requiring shelters be accessible for those with disabilities. (See Part I)

In addition to ensuring that each of the at-risk populations is addressed; individuals and organizations should ensure that certain supplies are available for those sheltering in place. As previously stated, shelter-in-place classically refers to remaining indoors at an individual's location when the outdoor environment is no longer safe. Individuals and organizations should ensure that materials to seal windows, doors, and vents (plastic and tape) are included in the emergency preparedness kits. (Stephens) Individuals should be aware of how to shut down ventilation systems at their homes and work places. Ensuring emergency preparedness kits are stocked, and the needs of at risk populations and individuals addressed, helps the response and recovery phases to be more easily accomplished.

SHELTERS IN A DISASTER

Shelters in disasters are set up for mass care, temporary housing, and life sustaining emergency assistance including first aid and feeding. The assumption often made during planning is that temporary sheltering is to provide safe haven until residents can return home. Sometimes long term placement and/or housing are needed. When long term placement is necessary due to destroyed homes and living places such as after hurricanes , tsunamis and the Fukushima nuclear plant breach in Japan additional planning of resources to find long term housing needs should be designed into shelter planning and outplacement. (FL disaster housing)

Sheltering, mass care, housing and first aid in a declared disaster may be deployed when housing and needs from resources of the local, tribal, state and territorial governments are exceeded. Resources are available under the National Response Framework Emergency Support Function (ESF) #6 – Mass Care, Emergency Assistance, Housing, and Human Services Annex. ESF #6, through multiple government agencies led by the Department of Homeland Security, FEMA and co-leader the American Red Cross provide assistance. Multiple other voluntary and faith-based organizations may serve as resources for materials, volunteers and other aid in the delivery of services to the shelter. (ESF #6) Additional deployment of Medical Reserve Corps and Public Health resources to shelters has been suggested to maintain vulnerable people in shelters who have chronic diseases but who do not have an acute destabilization requiring a visit to the emergency department and/or hospitalization.

Under the amended American Disabilities Act (ADA) of 1990 , those with disabilities and no acute medical care needs should be accommodated in general shelters, similar to the general population, with equal access to assistance. (ADA toolkit) There is ongoing concern and debate as to whether these standards can be retrofitted to general shelters and/or whether a different standard of care known as Crisis Standards of Care is applicable. (Gostin) Crisis Standards of Care apply when resources are limited and thus are allocated in a fair manner. If general, shelters have limited resources, such as. medical and skilled caregivers and those with ongoing needs for their disability or chronic diseases might be better served in a medical shelter where medical and caregiver assistance can be concentrated. (Fannin)

Types of Shelters

Thus, there may be three types of shelters (and/or three levels of care): General Shelter, Functional Needs Shelter, and a Medical Needs Shelter. (NJ) A general shelter accommodates individuals who have no medical or functional needs but who need emergency sheltering during times of voluntary or mandatory evacuation. A functional needs shelter can accommodate individuals who need caregiver assistance but no medical needs. They can also accommodate "general care shelter" clients. A medical needs shelter houses individuals who need dedicated medical care and attention. A medical needs shelter will require medical personnel to staff the shelter and assist in the care of these individuals with medical needs.

Examples of the individuals in the various types of shelters include individuals who are "self-sufficient" and need no assistance in the activities of daily living (ADLs) and have no ongoing medical needs in general shelters, such as healthy adults and children/infants with their parents or caregivers who are able to care for them. The functional needs shelter provides housing for individuals with functional needs who need caregiver assistance such as, those with limited mobility and/or impaired senses but have no need for ongoing medical care . Examples of functional needs individuals include amputees, wheelchair bound individuals, hearing or vision impaired with a seeing-eye dog. The medical needs shelter is for individuals with ongoing medical needs such as feeding tubes, TPN, dialysis, intravenous medications, or respiratory assistance.

Occasionally, "healthy" individuals appropriate for a general shelter and those with functional needs shelters will be in one location in a "combined shelter" with the general shelter equipped, supplied and staffed to care for those with functional needs. There would still be a separate medical needs shelter. (ADA US DJCRD) (ADAemrgprepguide) Theoretically, it is possible that one building could house all three populations; "healthy", functional needs individuals, and those with medical needs *provided* there was space, resources: equipment and staffing, and security to accommodate all three groups. In past disasters, this has generally had the least desirable conditions and outcomes. Ideally, those with special needs should be in a separate special needs shelter, housed together with their families and/or caregivers so the families and caregivers can help care for their loved ones and provide emotional support as they did when the special needs individuals were in their own domiciles. (Cloyd)

Categorizing shelter capacity and systems to accommodate vulnerable patients and the disabled is done with multiple tiered systems that include functional and disability status. Vulnerable persons may deteriorate functionally in crisis situations. Hence, intake and evaluation at shelter arrival and periodically during their stay is important. Those with chronic illnesses may deteriorate during diasters as well. (Cloyd) Vulnerable populations include the elderly, those with language barriers, visual and hearing impaired, those with mobility problems, infants, pregnant women, children, especially those who are unaccompanied by an adult, the chronically ill, those with mental health problems, and those who live in group homes with caretakers. .

AT –RISK OR VULNERABLE POPULATIONS

Children and Infants

Children and infants require extra shelter equipment such as diapers, cribs, age appropriate foods and games or other activities to keep them occupied and may take more supervision than adults. They also may need additional help with ADLs if not provided by, or cared for, by their parents, guardians, or adult caretakers. Intake and triage for children will need workers familiar with children's injuries, vulnerabilities, and mental health needs. Children can also be targets and victimized and/or abused after the disaster. (Mace & Doyle 2012) (Bradenburg) Access to pediatric specific mental health screening is helpful. (Mace & Sharieff part 3) Parents and caregivers can be taught about the mental health needs of children in disasters. Child abuse can also escalate after major disasters and social work follow up would be valuable. (Brandenburg) Reunification systems must be in place to provide secure access for family members and guardians to reunite with children. (Mace& Sharieff part 3) (Bradenburg) (Mace & Doyle) Organizations that have such systems for assistance with reunification include the National Center for Missing and Exploited Children and the American Red Cross (for children and adults). (Brandenburg) (NCEMC)

Individuals with Chronic Diseases and Comorbidities

Acute disease, exacerbation of chronic disease, and comorbidities in vulnerable populations, such as chest pain, dyspnea, dehydration, hypertension, injuries and mental health complaints, are common intake complaints in hurricane shelters. (Greenough) (Patton-Levine) (Arrieta) (Rios) (Currier) In addition, many individuals do not have their medications or not had ongoing treatment for chronic problems. (Bame) (Greenough) (Teramoto) (Veenema) Other documented problems include the need for durable medical equipment such asmobility devices: canes, walkers and wheelchairs,o glucose meters, glasses, dental devices, and hearing aids; and even, respiratory equipment/supplies: oxygen, nebulizer machines, and CPAP machines. (Jenkins)

Many vulnerable persons arrived to shelters in Hurricane Katrina/Rita without caregivers or medications, Some could not give any history and were unaccompanied by medical records. (Currier) (Deal) In some cases, the persons had been under a care plan at another shelter and were transferred to a medical shelter or a shelter with more resources. (Deal). (Arrieta) (Maja-Schultz) Hopefully in the future, with electronic records being more prevalent, plans to obtain and transfer records can be expedited. (Caillouet) Solutions to barriers to mobility, eating, transferring, sanitation (e.g. toileting and washing), as well as attention to privacy, will need to be considered in disaster planning. Nursing home and other residential medical facilities will need additional planning (agreements or memorandum of understanding) with facilities that can accommodate their patients, along with agreements for safe, comfortable transportation (appropriate for the disabled, those in wheelchairs and bedridden patients) to facilities or medical shelters that can accommodate them. (Parmar)   Some regions have initiated nursing home cooperative plans to accommodate patients and caregivers in like facilities. Many facilities depend on families to assist in helping to evacuate and obtain temporary care for some residents. Those who have county guardians may not have services available if the county guardian is involved in the disaster or has evacuated.

Those patients who receive chronic outpatient services (e.g. wound care, dialysis, outpatient IV drugs, cancer patients, hospice patients) may require additional services. Many dialysis patients did not know, or have an emergency plan, for dialysis or solutions to altering their diet. (Anderson) In Katrina and Rita, many dialysis centers, pharmacies, community clinics, private offices, and other outpatient facilities as well as some hospitals were evacuated and closed for a number of weeks. (Anderson) (Larkin) (Downey p 257) (Downey p 264) In addition, a large number of health care providers including physicians, nurses and other skilled caregivers may be displaced after a disaster. (Madamala) (Downey p257) This creates significant shortages of health care professionals both during and after the disaster. After a disaster, hospitals have reported understaffing up to 60% and a decrease in staffed beds up to 80%. (Downey p257) (Larkin)

Those persons with mobility devices: canes, wheelchairs, walkers; with oxygen and other assistive devices such as electrical pumps for delivery of nutrition (whether feeding tubes or total parenteral nutrition [TPN} or IV solutions) or fluids or medications; ventilators, oxygen concentrators, and other equipment/devices will need electrical and other support devices. (McGuire)

Individuals with Dementia

Safety systems and supervision of those with dementia requires advanced planning if housed at general shelters. (Cloyd) (Teramoto) Supervision, administration and safe control of medications is also an issue. (Cloyd) (Fanin), (Maja-Schultz)

Individuals with Violent Tendencies, Criminals, Sexual Predators

Some shelters may be inappropriate for individuals with violent tendencies including some with dementia, prisoners, and sexual predators. Other accommodations need to be preplanned for those who are not able to be accommodated. (Mace & Doyle) (Veemena)

Individuals with Acute Medical Problems

Multiple intake triage tools and triage systems have been proposed to identify those with acute decompensation and a need for acute medical care that mandates transfer to a higher level of care. There should be routine surveillance plans in place to identify residents that may have acute medical issues along with a means to evaluate and to make decisions about changing levels of care. (Cloyd) (Fanin) (Rios) Simple solutions such as attention to dehydration, medications and nutrition may forestallthe deterioration in medically frail individuals.

Crowded shelters may allow the rapid spread of communicable infections especially respiratory and gastrointestinal diseases. (Kawano) (Yee) (Suzuki) Plans for good hand hygiene, cough hygiene, and possibly cohorting those with symptoms that are stable enough to stay at the shelter need to be included in planning.

Communication Issues in a Disaster

Communication of shelter locations by community radio and television media, telephone or other means may miss people who have limited visual or hearing ability or do not watch local media. Some people may depend on caregivers who come into their home, and these caregivers may not show up because of personal or family involvement in the disaster,r impassable roads or unavailable public or private transportation.

Evacuation Issues in a Disaster

During Hurricane Katrina and Rita, many complained they heard evacuation orders but did not know where they should evacuate to. They did not know where shelters were set up or how to get there. They may not have had funds for gas for vehicles, money for food en route or understand that they needed to go to a bus stop for transportation. Some did not know to plan to take a kit with clothing and their medications. Many people are not familiar with the 211 telephone system that can direct people to resources. (Bame) People found their way to shelters that could not always accommodate their functional needs. Those planning for adequate and appropriate transportation, evacuation, and communication to all individuals (whether using transportation by private vehicle or modified bus service) in a given community or region may incorrectly assume that individuals are able to evacuate unaided to a bus stop, or has the availability of a private car and is able to drive. When some family members evacuated early, the remaining family members who declined to leave did not have transportation when mandatory evacuation was necessary. Often frail patients that are not in nursing homes or group care settings (e.g. reside in their own individual domicile) are not known to emergency planners. (Veemena)

In some situations, such as the acute phase of a hurricane, ambulances will not be available as they cannot drive at certain wind speeds, Roads may be impassable due to obstacles such as downed trees and power lines. Patient evacuation for an acute problem may need to be delayed temporarily until ambulances can safety travel. (Personal communication MI-1 DMAT) (Personal communication Al)

Mental Health Issues in a Disaster

Additional studies from Hurricanes Katrina and Rita shelters suggest that mental health needs for those who have acute crises resulting from the disaster and/or a lack of medication, might be attended by mental health workers at the shelters. Those with more severe or acute mental health crises can be triaged to other facilities, if available in the context of the disaster. Planning for spaces in shelters to find privacy to evaluate mental health needs should occur. (North 2015) (North 2013) Early identification and crisis counselling can help diminish PTSD symptoms that may emerge after disasters. (West) Recent emergencies; suchas the Boston marathon bombing, the Orlando night club shooting and the Las Vegas shootings demonstrated that mental health resources can be rapidly mobilized and made available after a disaster or terrorist event. (Castelluci) (Las Vegas) (Orlando) It has been documented that triage,

early evaluation, counseling, and intervention can do much in ameliorating the negative psychological effects of a disaster, on those with and without preexisting mental health disorders. (Mace, Sharieff)

Suggestions that sending those needing higher level psychiatric stabilization to a hospital or Emergency Department (ED) may not take into account that many facilities may be already overwhelmed with injured patients and patients with medical crises. Many EDs, even when there is no disaster, are already boarding patients. These "ED borders" are being accommodated in the ED indefinitely until an appropriate inpatient bed can be identified and transfer resources secured. It is not unusual for psychiatric and other acute medical and trauma patients to wait for an appropriate but limited number of beds during normal daily operations. Community psychiatric care beds are scarce, and it is not unusual to have extended waits for psychiatric beds (ACEP crowding) An acute inundation of psychiatric patients during a disaster may add to long waits for evaluation and admission and stress the already limited ED beds. A surge of psychiatric patients sent to the ED could delay care for acutely ill medical and trauma patients, thereby, leading to acute clinical deterioration of other ED patients in addition to likely delaying psychiatric evaluations and placement. (ACEP surge)

Mental health teams at shelters can address many of issues such as arriving at the shelter with no medication and temporary crises arising out of the disaster. Acute exacerbations and symptom relief for chronic problems may be more limited. Connections to other sources of local mental health care, if in operation at the time of the crisis, or sending patients to a medical shelter that can accommodate higher levels of acute psychiatric care are other options. (North 2015, North 2013) Some DMATs and other medical entities can be augmented with mental health providers. (West)

Summary: Medical Care as Part of CMIST

Additional Support for medical care is detailed under ESF -8 DMATs (Disaster Medical Assistance Teams) provide additional medical assistance to shelters, and are also charged with medical evacuation assistance. Medical and public health teams can augment triage, and shelter care as well as determining whether medical care can be rendered at the general or functional needs shelter level or whether a medical shelter or hospital resources are needed.

Part III: MEDICAL CMIST AND RECOMMENDATIONS

Sharon E. Mace, MD
Constance J. Doyle, MD
Kim Askew, MD
Stuart Bradin, DO
Mark Baker, MD
Madeline M. Joseph, MD
Annalise Sorrentino, MD

Corresponding Author
Sharon E. Mace, MD
Cleveland Clinic Foundation
Emergency Services Institute
9500 Euclid Ave, E-19
Cleveland, Ohio 44195
maces@ccf.org
(216) 445-4598 (office)
(216) 4454546 (administrative assistant, Kaitlin)

ABSTRACT

Although disasters can affect anyone in a given community or region, those with access and functional needs have the highest rates of morbidity and mortality during an emergency or disaster. There are many unique and complex issues that should be considered when dealing with these individuals in a disaster situation. Who are these individuals, what specific issues should be addressed when considering these members of the population, and what recommendations can be made in order to address their unique needs? How can we include them as part of the all-hazard, comprehensive approach to disaster management? The first part of this three-part series identifies who is included in this population and what are the legal considerations that arise in caring for not only this unique group, but all of the members of the community in a disaster. The second part considers evacuation, sheltering, and sheltering in place and communication, medical needs, independence, supervision, and transportation (CMIST) with a focus on mental health. The third part deals with the medical aspect of CMIST and with recommendations that may aid disaster responders and planners in caring for these high-risk individuals in a disaster.

MEDICAL CMIST

The M of CMIST refers to medical or maintaining health. (IS-0368) (phe.gov) The medical care component of Health and Human Services definition of At-Risk Individuals includes people who are not self-sufficient or who need support in the activities of daily living (ADL) and/or who require assistance with managing chronic, terminal or contagious conditions. These individuals need the help of others, e.g. personal care assistance or personal assistance services, in order to maintain their ADLs: eating, dressing, grooming, transferring and toileting. (phe.gov) Such assistance may be provided by caregivers, family, neighbors, or friends or by health care professionals, such as home health aides or visiting nurses. These individuals may require the support of trained medical professionals for monitoring and the administrating treatments including intravenous therapy, tube feeding, dialysis, or oxygen, etc. (IS-0368) Chronic medical conditions are generally defined as those conditions that last more than a year or more and require on-going medical attention and monitoring of vital signs and /or limit the ADLs.

Chronic Medical Conditions

The number of people with chronic medical conditions is expected to continue to increase steadily over the coming decades due increased life expectancy, decreasing death rates from heart disease, and improvements in treating previously fatal diseases. (Anderson G). Estimates for the prevalence of one or more chronic medical conditions are 125 million Americans (45% of the population). Approximately 61 million (21% of the population) have two or more chronic medical conditions. The elderly are the segment most affected by chronic medical conditions, with estimated prevalence of two or more conditions of 62%. Almost 50% of the U.S. population appears to meet this definition of having a chronic medical condition or has a functional need that places them at-risk during a disaster. (Kailes)

Continuity of care for chronic medical conditions may be disrupted following disasters. A study of public health and social service providers and patient focus groups following Hurricane Katrina identified ensuring continuity of medications for chronic mental health diseases: diabetes mellitus, hypertension, respiratory illness, end-stage renal disease, cardiovascular disease, and cancer as the highest medical management priorities among those displaced. (Arrieta) As of this writing, no health insurance company routinely pays for a two week to a month disaster supply of emergency medications that can be rotated to keep updated, in case of disaster and/or displacement.

Individuals with chronic medical conditions present challenges to disaster response planners. Personal and household preparedness among this segment of the population appears to be low. Despite awareness of the increased risk posed by disasters, households with special medical needs appear to be no more prepared for the disasters than the general public. (Usher-Pines) (Baker) This is a heterogeneous group with diverse medical conditions and needs in disasters

Special Health Care Needs

Children with special healthcare needs are defined by the United States Maternal and Child Health Bureau as children who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services beyond that required by children generally. (McPherson M) Estimates are that approximately 15.1% of children (age < 18 years) in the U.S., or 11.2 million children have special healthcare needs based on this definition. (Chartbook 2001*)* The prevalence of one chronic medical condition among U.S. children to 17 years old is 23%, with 5% having 2 or more chronic medical conditions. (Anderson 2004) Respiratory diseases predominate in this group. Asthma is the most common chronic medical condition among children, with studies demonstrating prevalence of approximately 8% among the general pediatric population. (Akinbami) The burden of chronic diseases, including asthma and obesity, among children is increasing. (JAMA 2010 Obesity) These conditions are dynamic in children, requiring frequent monitoring and adjustments of treatments. (Perrin) Factors purported to be driving the increase in chronic disease among children include improved survival for extremely premature infants, newer drugs and medical procedures that have resulted in improved survival, increasing youth obesity, and sedentary lifestyle. (Perrin)

Technology Dependent

Technology dependent individuals appear to be particularly vulnerable to the effect of disasters. Although no standard definition of technology-dependency exists, this group uses some form of medical technology, including medications or devices; and would, if the technology were to fail or its use be discontinued, likely suffer a sufficiently adverse health consequence that hospitalization would be required. (Fuedtner) (Greenwald) This working definition encompasses those on home ventilators, patients with apnea monitors, individuals receiving tube feedings, and dialysis patients. (Dworkin) Parents of technologically dependent children report higher levels of psychological stress related to care demands, which may result in impaired family functioning especially following displacement or service disruption. (Toly)

Power dependent equipment may be needed to support life for individuals requiring dialysis, oxygen concentrators, home ventilators, suctioning, or feeding pumps. (Anderson AH) (Laditka AJPH 2008) (Dworkin) (Greenwald) Technology dependent patients are at increased risk of harm due to electrical power interruption during disasters. The special transportation, which is often required for technology dependent persons, may also be limited in disaster settings. These individuals may be difficult to transport out of a disaster zone, requiring additional special vehicles or trained personnel to manage medical devices and oversee monitoring and care during evacuation. (Hasegawa) Technology-dependent individuals pose unique challenges to emergency medical services during transport. Pre-hospital providers may benefit from additional training in caring for this group of patients. (Lerner) Barriers to maintaining the continuity of medications for chronic diseases following a disaster include the patient's knowledge of medications, financial abilities, and regulations governing the dispensing of medications. These barriers may impede the ability of people to stockpile medications as part of personal disaster plans. (Arrieta)

Individuals with Mental Health Disorders

Mental Health: Adults

There has been an exponential increase in mental health disorders and substance abuse noted for the adult population and in in the pediatric population. (Lenze) (Butcher) According to the American Hospital Association, nearly half of Americans will develop a mental illness and about one-fourth (27%) will have a substance abuse problem during their lifetime. (AHA) A mental illness or a substance abuse problem is experienced by 25% of the U.S. population in any given year. (AHA) In the United States, the prevalence rate of adult mental illness (excluding substance abuse) is about 18%. (NI on Drug Abuse)

There is also a lack of needed mental health services for adults, as well as for pediatrics. (Natl Acad Sci 2012) More than half of all U.S. counties have no practicing psychiatrists, psychologists or social workers. (Butcher) Only about one-fourth (27%) of community hospitals have an inpatient psychiatric unit. (Butcher) State psychiatric hospitals have been closed in many states and there are few open beds in hospital psychiatric units. Kutscher) Emergency departments have often become the "default option for people with mental health crisis." (Wise) These patients may

be boarded for hours to days awaiting a bed in a psychiatric unit due to a shortage of psychiatric beds. This surging need for mental health services is further worsened when there is a disaster. (Schwartz) (Ozbay) (Tsubokura)

Mental Health: Pediatrics

Children often go without needed mental health services on a daily basis due to a chronic shortage of pediatric mental health professionals, (Koppelman) and limited insurance reimbursement for these services. (AAP) Recently, there has been an increase in the prevalence of ED visits for psychiatric illnesses. (Sills) (Goldstein) (Mahajan) In addition; there has been a major increase in the in demand for mental health services for children and adolescents in the ED and an increase use of EMS for pediatric patients with mental health problems. (Baren) According to joint AAP/ACEP policy statement "Pediatric mental health emergencies are an increasing part of emergency medical daily practice". This is due to the EDs becoming the safety net for an inadequate and fragmented mental health infrastructure. (Dolan 2006) This situation is even more complicated due to the shortage of inpatient and outpatient services available for patients who need mental health care and an unfunded mandate to care for these patients in an ED setting. (Dolan 2011) The 1999 Surgeon General's report on mental health indicated that 21% of US children 9 to 17 years of age have a diagnosable mental or addictive disorder. (Surgeon General). Furthermore, 5-6% of youth have a mental disorder that significantly impairs school performance, social functioning and abilities to meet the demands of everyday life (surgeon general). There is evidence of an increase in pervasive developmental disorders characterized by developmental delays coupled with impairments in language, communication and social skills. Severe mental disorders; such as autism, childhood-onset schizophrenia, mood and anxiety disorders, obsessive compulsive disorders, attention deficit disorders and severe behavior control problems; often require ongoing psychopharmacological interventions. Disasters typically disrupt the family system which is already challenged to maintain effective support and essential therapy for children with psychiatric needs.

The National Institute of Mental Health has reported that 10% of children in the United States currently suffer from mental illness, and more than 13 million children require mental health or substance abuse services. (NIH). When children experience sustained stress related to natural or man-made disasters, neuro-hormones, such as cortisol, are increased leading to permanent changes in their developing brain structures, such as the amygdale and hypothalamus resulting in posttraumatic distress disorder (PTSD) and depression. (NSC) If unrecognized or untreated, PTSD can cause lifelong behavioral and mental health problems. (Carrion) (Winston) (Ourwitch) These include psychological disorders, anxiety, school failure, developmental regression, aggression and substance abuse.

Numerous factors such as parental coping, extent of direct exposure to the stressful event can influence the child's psychological risk. Following the World Trade Center attack on September 11th, a study of pre-school children and their mothers demonstrated that children are more prone to develop clinically significant behavioral problems if their mothers experience depression or PTSD, particularly in boys. (Nomura)

Pre-existing mental health conditions results in increased risk for development of psychopathology among children. (Pfefferbaum) Distress, maladjustment and the development of psychopathology can occur in anxiety-prone children with exposure to an environment of threat or even expectations that a major event is imminent. (Comer) In addition, young children are at higher risk for mental health consequences of disaster and terrorism due to difficulty in processing and dealing with the disasters events due to immature cognitive skills. Lack of abstract concept and reasoning in young children may lead to their belief that the disaster will continue indefinitely leading to additional stress. Children and adolescents with emotional problems may exhibit an extreme reaction to the disaster. The difficulty of dealing with and coping with a disaster is likely compounded in patients with cognitive deficits.

Of interest, event-specific factors have significant importance on the psychological impact. (Baren, part 3) This was evident from findings from Hurricane Katrina that revealed that more than 50 percent of impacted children developed a new behavioral health disorder. This could be also attributed to caregivers' difficulty in coping with such an event. Women caregivers were almost nine times as likely to report that they were not coping well with the daily demands of parenting, when compared to parents in a pre-Katrina survey of urban Louisianans." (Abramson)

Mental Health: Recommendations

Mental health triage during the disaster, coupled with counseling and appropriate referral for those with more serious mental health conditions, will do much toward alleviating the mental health effects of the disaster in individuals with no prior mental disorders, as well as for those with pre-existing mental health disorders. (West) (Mace & Sharieff)

Psychological First Aid (PFA) is a commonly used intervention after a disaster. PFA generally includes PsySTART, which is a rapid mental health triage and incident management system. PsySTART does not measure symptoms; but instead uses objective indicators of the extent of direct event exposure, injury, traumatic loss, and secondary aftermaths (e.g., loss of home, relocation, parental distress). PsySTART has been shown to predict which children are at greatest mental health jeopardy. (Schreiber) PsySTART is used to address the critical need to identify the subset of "at-risk" children early and to coordinate across multi-sector, local "pediatric disaster systems of care (EDs, EMS, public health agencies, and mental health agencies). (Wong)

The PsySTART model is currently part of the American Red Cross Disaster Response System. The system was successfully used by the Centers for Disease Prevention and Control in support of efforts by the Thai Ministry of Health following the Tsunami and by the American Red Cross during the TOPOFF national terrorism exercise and more recently in the American Red Cross Hurricane Ike response in the first real world, large event disaster mental health rapid triage and incident management demonstration effort (Schreiber & Teten)

Children with special health care needs frequently have coexisting psychiatric morbidity. (Canty-Mitchell) (Ganz) (Stuber) For example, children with asthma and allergies are especially prone to having anxiety disorders. (Chavira) Obesity is also associated with problems such as depression, especially in Hispanic and black children. (BeLue) The Emergency Information Form (EIF), developed jointly by the AAP and ACEP allows providers to include psychiatric and behavioral diagnoses for children with special health care needs and also includes information about their health care professionals, medications, and significant medical history. (COPEM -EIF)

Following a disaster, the gap between needed mental health services and available resources become even larger due to the significant increase in the demand, limited surge capacity among providers, lack of available transportation, and many other distracting and competing family survival and recovery needs. (Mace & Sharieff) In New York, following 9/11, only 27% of children with "severe/ very severe" post-traumatic stress reactions received any mental healthcare in the months afterward. (Fairbrother)

Observations identified from Hurricane Katrina included reports of parents and caregivers having difficulties in finding appropriate and accessible mental health services. In addition, several respondents noted that it was increasingly more difficult if not impossible to maintain their own prescribed psychotropic medications, either because they could not find appropriate psychiatric help or their medical records had been lost. (NCDP/Millman)

Children's psychological responses may be delayed or may increase over time. It includes regressive behaviors, sleep disturbances, fatigue, unusual expressions of anger, change in sleep and appetite. Some babies may become irritable and have difficulty with sleeping. These symptoms could also be noted but overlooked in young patients and patients with mental retardation due to the limited ability to express their emotions. Studies of children who received treatment following September 11th demonstrated that older children 6-17 were more likely to receive services than younger patients.

Similarly, adults may experience new-onset disaster-related psychiatric disorders as well as exacerbation of pre-existing psychiatric disorders. (North) Like children and adolescents, adults also have may also have psychological symptoms and mental health disorders long after the initial disaster or terrorist attack. (Carmanica) (Ozbay) The take home message is that early intervention and treatment for psychological distress and/or mental health disorders following a disaster, for any individual of any age, has significant short and long-term benefits. (West Ch. 9)

Other Categories of Vulnerable Individuals

Consideration must also be given to other subsets of individuals who are at an increased risk during a disaster. These include those who have language isolation (no or limited English proficiency), are geographically dispersed (e.g. those residing in rural and/or wilderness areas), transportation disadvantaged (lack a vehicle needed for evacuation ort

inability to drive), minorities, and those who are socially isolated including those confined to prison, juvenile detention centers, substance abuse treatment centers and halfway houses; those who are in shelters for domestic violence; illegal immigrants, and the homeless including runaway youth and those who remain on the streets. Many of these individuals are outside of the reach of systems that provide safety, shelter, services, and support during disasters. (Eisenman JHPU) (Mace & Doyle 2017) (Eisenman AmJPM) (Wexler)

ISSUES TO BE CONSIDERED AND RECOMMENDATIONS FOR CMIST: COMMUNICATIONS, MEDICAL, INDEPENDENCE, SUPERVISION, TRANSPORTATION

Communications

How do we reach those who are non-English speaking or have limited literacy? How can we warn the hearing impaired about a disaster if they can't hear a warning siren or television/radio announcements? Similarly, how do we warn the visually impaired if they can't see warnings? How do we reach the disadvantaged, who may not have access to our usual technology: television, radio, and telephones? How do we find and communicate with those who do not have a permanent address: those in shelters, halfway houses, and the homeless? How do we reach those separated by long distances in rural or wilderness areas? How can we tailor our message to minorities and the disaffected: illegal immigrants, former prisoners, and others; in order to increase their receptivity to our messages regarding the disaster?

Reading literacy, cultural considerations, languages spoken, sensory impairment e.g. ability to hear, and ability to see, all need to be considered when communicating in a disaster situation. Providing timely and adequate information regarding the disaster, whether the decision is for evacuation, going to a shelter, or sheltering in place must be communicated to all members of the community.

Printed and verbal information regarding the disaster should be in the language(s) of the affected individuals and their families or caregivers at a literacy level that individuals can understand. Thus, information/warnings should be in languages other than English in order to reach the non-English speaking members of the community affected by the disaster. Closed captioning on the television and use of newer technologies; such as the vibratory mode on I phones, and text paging may help reach the hearing impaired. A message in braille or the vibratory mode on I phones may reach the visually impaired. Use of social media also provides an avenue for reaching members of the community. Inclusion of trusted members of the minority community who may speak the minority language going with law enforcement or other government officials when contacting individuals in the community regarding evacuation or sheltering may foster trust and acceptance of the government's decision/recommendations. Social support/ community groups may have knowledge of who and where the homeless or others with a nonpermanent residence can be located. Various technologies may be useful in communicating with those in rural or wilderness areas.

Reuniting individuals with their families is an important issue after a disaster. Here again, social support groups and technology may be of assistance. There are organizations that can assist with this process (Table 1). Social media has also played a role in more recent disasters. For example, in 2017 in Puerto Rico after Hurricane Maria and after the California wildfires, social media; including Facebook, Twitter or Linkedin; was crammed with messages. People were asking if anyone has seen their family member (name, sometimes with identifying information), would they please let us know he/she is safe and where they are. Other social networking groups such as: Physicians Mom Group, or EM docs, were full of messages including whether someone had a spare room so they could take in a friend or colleague who was fleeing the California wildfires. Such social groups and technology are especially valuable when the usual avenues of communication have been interrupted and unavailable because of the disaster.

Medical Care

Effective channels of communication and dissemination of timely and accurate information is critical to all facets of a disaster. This is particularly true for populations of patients requiring specialized medical and home care. These special populations need information regarding the roads, equipment and services that they rely on for their daily living and treatment in order to make decisions that would determine whether it is safe to shelter in place for an extended period of time or if they must seek medical attention or a specialized shelter to address their needs.

Those patients with powered devices, and those with special underlying medical problems may have exacerbation of their disease, may need access to special services such as dialysis, or special diets to allow additional spacing between dialysis runs. The elderly, in particular, are higher risk for more pronounced injuries and delayed recovery from

disasters. Pregnant women will need planning for their needs and access to obstetrical and pediatric services, as indicated. Mental health group home patients may need special sheltering, if there is not an alternate plan.

Providing adequate ongoing supplies of oxygen, is essential for those who are oxygen dependent; otherwise, they may end up in the ED when their oxygen tanks run out even if they have no other medical needs. Similarly, those who are dependent on various equipment/supplies (respiratory, feeding, devices, lines/catheters, etc.) should have access to an adequate stockpile of needed equipment/supplies to last, at least, for several days, or even weeks. Those who are technology dependent will need alternative sources of power, such generators, and access to fuel for those generators.

Having adequate supplies of clean water and food for days or even weeks is essential in preventing illnesses from contaminated water, such as leptospirosis. This was evident recently with the problems resulting from lack of electricity and lack of fuel for generators, and no clean water months after Hurricane Maria devastated Puerto Rico. (Scutti) (Singh) Similarly, in Haiti after Hurricane Matthew, there was an outbreak of cholera and in Japan after the Great Eastern Japan earthquake and tsunami, there was an outbreak of acute respiratory illnesses and acute gastroenteritis. (Ferreria) (Kawano 2014) (Suzuki) Those at the extremes of age: the very young and the elderly, and those with chronic disorders, are most vulnerable to the infectious diseases, whether gastrointestinal or respiratory, that can occur after a disaster.

Whether in undeveloped or developed nations, attention to basic public health needs: adequate supplies of nutritious food, clean water, and sanitation; privacy and space in shelters, and security are critical in preventing outbreaks of illness following a disaster, which disproportionately affect the most vulnerable individuals. (Parmar) (Kawano 2015) (Tsuboyama-Kasaoka) (Kolbe) (Tokuda)

Independence

Mobility is a major concern in a disaster. Those with limited mobility or who are bedridden will need assistance in an evacuation. How does someone with limited mobility evacuate from the upper floors of a building whose elevator is not working because of loss of electricity and then navigate around the debris, and other obstacles; such a downed power lines, trees, flood water etc.; that are in the streets in order to get to a shelter or to the transportation required for evacuation? Those patients with service animals will need to have their animals included in their plans and shelters need to have the ability to accommodate these service animals.

Many types of patients are dependent on rotating caregivers whether in an institution or living in more independent settings. Caregivers; whether family, friends, neighbors or health care professionals; may be affected by the disaster and unable to reach and attend to the vulnerable individual needing assistance with their medical care and/or ADLs. Therefore, pre-planning alternative care for multiple scenarios needs to be done in advance of the disaster.

Supervision

Many types of patients have special supervision needs such as nursing home patients, group home patients, some psychiatric patients, unaccompanied minors, the elderly with cognitive impairment or dementia, and high security patients that cannot be released to shelters or other venues without adequate supervision (prisoners, parolees, sex offenders). Sex offenders that are a danger to children cannot be housed in shelters with children. While this may not be the medical purview of emergency physicians, those that are part of planning at the community level and beyond will need to have these considerations in mind. Maintaining safety from abuse and fraud for vulnerable elders, the developmentally disabled, and unaccompanied minors is an important consideration. Prior to releasing individuals from field or ED medical care, there should be assurance that supervision needs are met in order to safely discharge the patient if they do not need hospitalization.

Transportation

Many vulnerable patients are dependent on public transportation, handicap access public transportation, and mobility aids such as wheelchairs and scooters that may not be available to transport patients to safety, to medical care, and upon release to a housing facility. EMS and ED's may be taxed when patients seek medical care and are unable to access any other clinics or outpatient care and evaluation. (Scutti) Facility planning and special needs planning for transportation access prior to a disaster needs to be addressed at multiple levels. Addressing the needs of the transportation disadvantaged, who may not own a vehicle, or be able to drive (as is true with many of the elderly), or have the financial resources for a vehicle or purchasing gasoline and other supplies is another consideration.

INDIVIDUAL PREPAREDNESS

Plan for extended food and water and a week's supply of medication
As with all components of disaster preparedness and response, including special populations of patients, individual preparedness of the patient and their families is key. (ACEP toolkit) (AAP- Fagbuyi) Patients with special needs must have robust personal preparedness plans, beyond obtaining a basic survival kit. Sufficient medications for one week should be included in their kit, along with relevant medical documentation and contact information. Food and water supplies should account for both the patient and care-takers and should likely be more than is recommended for basic 72-hour survival. Due to mobility issues for the elderly or chronically ill and difficulty in obtaining appropriate and available transportation, evacuation time in a disaster may take longer than anticipated. (Dosa 2007) (Johnson) (Dostal) (Dosa 2008)

Create a medical contact card
A communication plan and detailed documentation is essential for special patient populations. (ACEP toolkit) (EIF COPEM 1999) In addition to the standard recommendation for a contact card/information, a disaster kit should include detailed medical documentation. A medical information card is the most useful format and should summarize the following information: past medical history by problem, medications, oxygen requirements if applicable, allergies, and physician or specialty clinic contact information, such as dialysis center phone numbers.   Nursing home residents should have this contact card maintained and stored by their facility for reference at the time of a disaster. Elderly persons or those with special needs, primarily cared for at home should maintain their own list or have it kept with their disaster kit. In addition, many EMS systems are trained to look for medical information as well as physician orders for life sustaining treatment (POLST) or do not resuscitate (DNR) orders on the door of the refrigerator in the home. A second information document could be kept in that location.

Know and use your networks
Prior studies have demonstrated that social networks can improve disaster preparedness and response within minority groups, who historically have low-levels of disaster preparedness. (Eisenman JHCPU) (Eisenman AMJPH) (Carter-Pokras) Patients with special needs should be registered with a broad range of networks. Different types of media can help keep a patient with special needs in touch with their community and resources.   Those who require special medical therapies such as dialysis or wound-care should be sure to have emergency call-lists for their clinics or in-home providers, where they can call to obtain updates regarding access to treatments. Local and regional networks with appropriate referral may also be advantageous. (Hoyt) (Coleman) Hospital-based support groups for patients with chronic conditions can be excellent resources for pooling supplies and knowledge in a disaster, but only if their members plan in advance. Neighborhood Emergency Response Teams (NERTs) can be of assistance if they know in advance of the special needs of their communities. Patients with medical care requirements should register with their local NERT. Finally, text messaging and electronic media through smart-phones is growing in utility. (Eisenman AmJPM) (Kim) Many state and local governments have text message alert systems, such as NIXLE, to inform the local population of hazards and evacuation plans. Nixle alerts in the app store for cell phones. Twitter, Facebook, and other social networking websites are also a useful platform for government and private agencies to disseminate critical information.

See the doctor—remotely
Telemedicine is a growing discipline that has potential to shift some of the burden of medical care and decision making away from hospitals in times of disaster. (Alverson) It can be particularly useful for management of patients with chronic illnesses such as lung or kidney disease. Patients with chronic conditions, especially those who anticipate difficulty with evacuation and a need to "shelter in place" during a disaster, should ask their specialty providers if there is a telemedicine service to which they can subscribe. Additional electronic equipment and internet access may be needed to participate. Successful telemedicine also relies on a stable electrical infrastructure.

HOSPITAL-BASED PREPAREDNESS

I. Communication

Create and leverage patient networks
Hospital-based disaster preparedness efforts should review a hospital's existing patient networks and identify gaps in hospital-patient communications. Many specialties serve patients with chronic conditions that require frequent hospital-based interactions. At worst, these services could be disrupted during a disaster, or at best could be moved elsewhere offsite to accommodate for hospital surge requirements and/or if hospitals are impacted and nonfunctional

because of the disaster due to power outages or other conditions. (Hoyt) Such services include treatment centers providing dialysis, chemotherapy, or physical therapy. However, less resource-intense groups that should not be overlooked include support groups for patients with chronic or terminal illnesses. These groups often have well-established social networks and members who are aware of the varying medical needs in their group. These groups provide a redundant mode of communication, as their leaders often keep separate contact rosters. Additionally, the personal investment of the members in the lives of each other provides an excellent platform from which to coordinate personal disaster preparedness efforts and to conduct outreach to other patients with chronic conditions within a hospital system.

Design robust and redundant communication systems
Every hospital or long-term care facility should have multiple avenues to communicate with patients and staff in the setting of a disaster. (Blanchard) (Laditka 2007) (Greenwald) Phone-based hotlines are easy to establish and update. Hospitals should consider having either separate lines for different patient sub-groups or an easily navigable menu that can direct special populations of patients to specific information regarding their treatment availability. Phone-trees and active messaging systems should be considered by departments who have patients with frequent or resource intensive utilization of their facilities. Such interventions may help to prevent unanticipated hospital arrivals for special patient populations. Web-based communication may be useful for some groups of patients, particularly as a centralized information resource for those patients in need of specialized medical supplies or multiple or complex resources. Care should be taken to include audio and written messages in multiple languages that are prevalent within the local community, and among patients with special needs.

Radio-based communications are an essential form of redundant communications. To date, radio has been the only 100% reliable means of communication outside of a disaster area, as phone lines and computer systems may be down for a period of time in the early response. Hospitals should have a dedicated cache of radios and personnel trained to provide communication services. Additionally, hospitals should be aware of other local radio operators, such as HAM radio operators that can send long distance radio signals as a redundant system and should encourage groups of special needs patients to have access to radio communications with their hospitals to facilitate transport decision-making.

Formalize Partnerships
Hospital-based preparedness must include formalization of community partnerships with local nursing homes, shelters, and medical suppliers. During a large-scale disaster, vital medical services (such as oxygen supplementation or medications) may be unavailable at sub-acute facilities. In these circumstances where large numbers of patients with only targeted needs may be expected, a broader communications plan would be more effective. (Greenwald) (Laditka 2007) (Prezant) For example, rather than transferring one patient at a time via ambulance to local hospitals, sub-acute facilities could call ahead to their area hospital(s) to request specialized group services. Similarly, if pre-existing agreements are in place with local shelters or community buildings, a special-needs shelter could be established away from the hospital, thus preserving critical beds. Pre-existing agreements should be established between nursing homes that would agree to house another nursing home's patients if that nursing home is affected by a disaster and needs to evacuate to a non-affected nursing home(s).(Laditka 2007) Nursing homes can also be used as a community resource during a disaster, and are especially valuable since they generally have access to oxygen, medical equipment and supplies, medications, and already have staff who are experienced in caring for patients with access and functional needs. (Laditka 2008) Most hospitals have transfer agreements already in place for transferring specialized types of patients, such as trauma or pediatric patients who need specialized services not available at the transferring facility. Similarly, hospitals should have preexisting transfer agreements for the evacuation of patients during a disaster should all or part of the hospital facility be nonfunctional due to a disaster or terrorist attack.

Such efficient patient transfers are only possible if communication protocols for bed and resource polling are established ahead of time. Hospital disaster planners should reach out to local nursing facilities, shelters, and other hospitals to perform capability assessments and ideally, protocol development for patient transfers, equipment allocation and distribution as these pertain to anticipated surge requirements. State and Regional Medical Coordination Centers {MCCs} can provide coordination among regional hospital assets and can help triage and allocate beds. Assistant Secretary for Preparedness and Response (ASPR) grants provided for computer systems for coordination of beds and triage to higher or lower acuity of care in disasters

Telemedicine, Remote-Medicine Planning
Hospitals should consider a variety of communication systems for assisting in the decision-making and delivery of health care to patients with special needs. Resources may be limited for providing full, regular services to patients with chronic conditions. However, with appropriate information from patients and their families, physicians can help

to best allocate resources to reach the broadest number of patients. For example, patients requiring dialysis on a regular basis, could possibly have their schedules stretched in the setting of a disaster. Telemedicine could allow a hospital or home-based physician to help coordinate the utilization of a dialysis center functioning at reduced capacity. For example, a remote physician could review point of care laboratory tests and patient symptoms noted by family or a visiting nurse and then prioritize the delivery of this limited resource. A similar scenario could play out for other special needs patients such as those with chronic liver or lung disease, where on-call physicians could help to guide home therapy delivered by patient families or therapy in shelters. Although the hospital facility itself may not be at capacity or damaged during a disaster; with adequate systems planning, specialty services could still provide chronic care, remotely.

II. Transportation

Patient-based preparedness
Through the avenues outlined in the communications section of these guidelines, patients with special medical needs should be encouraged to create multiple evacuation plans for possible disasters affecting their area. A robust evacuation plan would include redundancies in means of transportation and routes. If established, MCC's can help coordinate transportation plans.

Hospital-based preparedness

Needs assessment
Hospital-based preparedness for transportation issues arising from a disaster begins with a needs assessment of hazard vulnerabilities. Hospital planners should develop a transportation plan that accounts for a variety of contingencies: from scenarios involving reverse-triage (early discharge to accommodate an influx of patients) to complete physical plant failure (where all patients would need to be discharged or transferred/evacuated from the hospital).

Additionally, hospitals should establish transport decision protocols in advance of a large-scale disaster regarding how patients will be prioritized for evacuation (i.e. order of departure). Hospitals should be aware of any state or local legislation relating to patient evacuation and abandonment. However, in the absence of outside guidelines, hospitals should establish pre-existing guidelines to assist the hospital staff on call during a disaster in optimizing resource allocation. MCCs can cooperate with State assets and help with interfacility transfers and staff asset transfers.

Patient-based systems
All hospitals should have patient transportation protocols and materials readily available for utilization during a disaster. Pre-made templates which can be easily populated by staff to share critical patient information regarding current medical problems, treatments, allergies, family contact information, transferring hospital and resuscitation status. Medical equipment specific to patient medical issues should be up to date and available for long distance transport, including oxygen, masks/cannulas, suction equipment, and BLS medications. (Dosa 2007)

Transport kits should also include ancillary supplies such as area maps for alternate route planning and working radios. Adequate food and water (for patients and transport staff) should also be allocated for this purpose, as transportation times can be significantly longer during a disaster due to infrastructure failures, vehicular traffic volume and impassable roads. (Henderson) (Mori) (ABC news) (Hogan)

Additionally, patient-tracking systems are critical for patient and family follow-up during the recovery and mitigation phases. Hospitals must have a standardized way to track the transportation modes and destinations of any patients being evacuated during a disaster. Multiple redundancies should exist for such a system (i.e. a hospital should not plan on relying on a computerized system alone). Vehicle-tracking systems (either by radio, GPS, or phone-based dispatch) may assist this process, but patient-based tracking should be separate and hospital-based.

Network Formation and Formalizing Partnerships
Hospitals should work to foster and formalize partnerships with transportation and vendors as well as other nearby facilities requiring transportation services in the setting of a disaster.   Hospitals should know what commitments are guaranteed within their vendor contracts for transporting patients from the hospital. Specifically, caps on the number of patients per transport and distance of transport are among the critical information to be shared. Contracts should include commitment to coverage during a disaster as well as possible modifications to pre-existing protocols should the transport of a higher volume of patients over a greater distance be required during a disaster. Redundancies of evacuation routes should be incorporated into the primary disaster plan.

Understanding what vendor relationships exist with near-by facilities is also critical for hospital resource planning and responsiveness. Should a hospital's surge and evacuation needs exceed its existing resources, the hospital may then need to rely on mutual aid or broader oversight for resource.

Trained volunteers; as with the Disaster Medical Assistance Teams (DMATs), Medical Reserve Corps (MRC), or the American Red Cross; have assisted in a disaster in many capacities ranging from evacuation, maintaining hotlines, triage, sanitation, and care at shelters. They can be a valuable resource and have provided support for higher risk patients that were exposed to "transfer trauma." (Phillips) Developing a relationship with such groups can be a valuable resource, especially for hospitals that have a shortage of personnel during a disaster situation, since their usual employees may be unable to get to work due to impassable roads or unavailable transportation and/or are unwilling to leave their families during a disaster. Some of these teams are federal assets and must be requested through established a chain of communication and command under the National Incident Management System (NIMS)

In the setting of a large-scale disaster, local resources, including transportation, will likely be overwhelmed and depleted. (Dosa 2007) When possible, hospitals should also pursue broader inter-facility relationships for mutual aid across city, county, regional, or state lines in order to acquire further resources for transportation purposes. Some of these, coordination centers have been established under Health Resources and Services Administration (HRSA) and ASPR grants.

If the patient is not able to return to their normal community setting, discharge planning to alternate situations and facilities will be part of the preplanning to mitigate the impact and to prevent unnecessary admission to the hospital that may already be stretched. Accessing care for these patients can be addressed at the time of the disaster or preferably, emergency physicians can participate with community planners to include alternatives for these groups of people.

SUMMARY

In a disaster, the highest morbidity and mortality rates occur in patients with special healthcare needs. Thus, caring for patients with access and functional needs in a disaster should be an integral part of disaster planning and management. Consideration for CMIST: communications, medical care, independence, supervision, and transportation for vulnerable populations should be incorporated into all phases of disaster management in order to foster the optimal outcomes for this high risk population.

Table 1 Information Regarding Organizations/Resources in the United States and Internationally to Assist in the Reunification of Individuals with their Families

• National Data Base
Website: http://www.namus.gov Government site,
An individual name can be placed in the database,
The database can be searched for a name.
This site includes unidentified and unclaimed (deceased) persons.

• Red Cross in the United States
Website: http://www.redcross.org/get-help/disaster-relief-and-recovery-services/contact-and-locate-loved-ones
Website: http://safeandwell-es.communityos.org/zf/safe/add
The American Red Cross "Safe and Well Program" allows an individual to list themselves as being safe and well and also allows one to search for a family member during a disaster.
Following the recent disaster after Hurricane Maria in Puerto Rico, there is a link in Spanish
https://safeandwell-es.communityos.org/zf/safe/add

• Red Cross Regarding International Disasters
http://www.redcross.org/about-us/our-work/international-services/reconnecting-families
During a disaster, armed conflicts or other emergencies; this site assists in locating families and
Goes through the International Red Cross/Red Crescent.
It includes a web inquiry form.

• U.S. Department of State: Office of Overseas Citizen SeRVICES AND Crisis Management
Website: https://travel.state.gov/content/passports/en/emergencies.html

Phone: 1- (888)-407-4747

• National Center for Missing and Exploited Children
For missing children and possibly trafficked children
Website: http://www.missingkids.come/home
Phone: 1-(800)- thelost or 1- (800)-843-5678

Amber Alerts for Missing Children
Silver Alert for Missing Seniors and Other Vulnerable Adults