Emergency Preparedness Challenges Facing Nursing Homes in Rural Regions of the U.S.A.

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Key Words

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Abstract

This paper and associated presentation will focus on current emergency preparedness challenges facing nursing home administrators and their staff in rural regions of the United States when faced with a natural or manmade disaster. Challenges related to site location - land use management, facility assessment, community coordination, evacuation and sheltering in place will be addressed.

Examples and recommendations highlighted will be drawn from research based on responses of nursing home administrators to improve response following catastrophic disasters, case studies of rural nursing home challenges monitored by the author in the period 2012-2014. When providing a description of problems created by the lack of land use management in rural regions of the United States the paper will also include a brief description of a unique land use management systems designed to meet the needs of rural counties or regions. This system is entitled the Land use Guidance System and is one method local governments can successfully adopt to reduce the risk of hazards located on adjacent land parcels or in the same watershed. Participants attending this session will be able to discuss current associated with sheltering-in-place and evacuation list possible actions to reduce risk, protect lives and improve response to an emergency requiring a nursing home to evacuation or shelter-in-place.

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Introduction

Emergency preparedness challenges face nursing home administrators and their staff in rural regions of the United States when faced with a natural or manmade disaster. These challenges are related to site location- land use management, facility assessment, community coordination, evacuation and sheltering in place. Many of these challenges were experiences by nursing homes in the 18 states located on either the Gulf of Mexico or the Atlantic Coast when hurricanes Katrina, Rita and Gustav hit the region (Blanchard and Dosa, 2 009), (Dosa et.al. 2007). The aftermath of Katrina documented many deaths. Of those fatalities 74% were individuals 60 years of age or older. Further challenges were reported for elderly residing in nursing homes. One of these challenges was the inability of St. Kits Nursing to evacuate resulting in 34 drowning deaths. Evacuation challenges reported during Hurricane Rita included the use of substandard buses resulting in further nursing home resident deaths when the bus exploded and caught on fire during transport (Polivka-West, 2006). Other challenges were directly related to the lack of readiness or resources to shelter in place on site for 10-12 days with no community provided electricity, food or water (Castro, 2008). This paper will outline key areas that a nursing home must address in rural regions of the United States to allow the facility to better respond to an emergency by successfully evacuating or shelter-in-place (Cloyde and Dyer, 2010).

Nursing Home Residents: A High Risk Group

Elderly residents are the most vulnerable to injury, sickness and/or death during and following a natural or manmade disasters. The vulnerability of elderly can be increased if they are required to evacuate during a disaster or suffering from dementia. (Brown et. al. 2012), (Smith, 2007), Castle, 2001) (Marcus et. al, 1972). Of the 1,200 individuals who died during

Hurricane Katrina, 74% were over the age of 60 and 50% over the age of 75 (Baylor College of Medicine).

In the United States at the present time most nursing homes manage the planning, training for evacuation or sheltering in place with little to no assistance from state, regional or local government emergency agencies (Department of Health and Human Services, Office of Inspector General- Nursing Home Emergency Preparedness and Response…). In 2007 Laditka, S.B. et. al. reported the 17,000 nursing homes in the United States housed over 3 million residents. This study also projects nursing homes will be responsible for an even greater percentage of the U. S. population in the future and many will be located in areas vulnerable to natural disasters such as flooding since such a large portion of the population live in coastal areas (Laditka S. B. et. al. 2007). A related study published in 2008 by Dosa et. al. reported of all individuals living in a nursing home in the United States one half live in one of the eighteen Gulf or Atlantic coast states prone to hurricanes, floods as well as other natural hazards (Dosa et. al., 2008).

Site Location: Avoiding Natural and Technological Risks

When choosing a site location for a nursing home facility in the rural areas of the United States the following questions related to the characteristics of the specific land in question and adjacent land parcels should be addressed:

- Is the site adjacent to or in a flood plain?
- Is it a water drainage area for adjacent property?
- Is the adjacent land stable? Or subject to frequent forest fires?

(Chan and Parker, 1996), (Chan, 1998)

It is also important to know the proposed site is not adjacent to a main highway, a freight line or major industry utilizing large amounts of hazardous, toxic or flammable materials (Smith, 2007). All of the questions listed above can help determine if a natural or technological hazard could exist or develop that could impact residents of a future nursing home.

Protecting Your Facility from Future Hazards

To protect a newly constructed nursing home or an existing facility, it is important for facility administrators or managers to encourage small or rural communities to adopt an effective form of land management to protect their facility from future negative land use related impacts unless a system is already in place. Implementing a land use management system is a critical step in creating or maintaining a disaster resistant community (Witt, 1997). For most small communities in the United States traditional zoning has not been adopted as a preferred methods of managing land use and related hazards. Most rural communities have elected not to adopt any form of land management system. In these communities with no land use management or planning system a nursing home facility is vulnerable to additional natural or technological hazards because negative land use changes on adjacent land are allowed with no controls or assessment (Smith, 2007), (Smith, 1993).

One land use management system that has been adopted by several rural communities and been successful in encouraging appropriate land use changes and discouraging other is the Land Use Guidance System (LUGS). This system allows local adjacent land owners to actively participate in the process of determining if a change in land use or traffic access should be approved but does not involve zoning parcels into a narrow land use category. The process is faster to complete than the typical traditional zoning processes. If adopted this

participatory land use management system allows adjacent land owners, including nursing home administrators and other community members to actively respond to all changes proposed on adjacent properties prior to approval by a county or town planning committee without requiring individual zoning of each piece of property. Using a management system such as LUGS allows existing adjacent facilities to consider whether new changes in land use will increase hazards such as the risk of flooding, transportation accidents, or exposure to toxic hazards or be a positive benefit to the neighborhood. See Figures 1 and II for an outline of Steps followed when the Land Use Guidance System is implemented at the community level (Smith, 2001) (Smith and Huskins, 1996) (Smith, 1996), (Smith and Moore, 1999), (Bedford County).

Building or Retro-fitting a Nursing Home to Facilitate Sheltering or Evacuation

In addition assessing the site location, and encouraging a community to adopt a land management system, it is also important when planning the design of the actual structure to specifically consider emergency evacuation and sheltering in place. This is important when choosing the design for a new facility or remodeling or expanding an existing facility. Choosing a new building design that allows for effective shelter or evacuation is always the best practice when possible. If a facility design is chosen with a "spoke like design" or a design where almost all resident rooms have windows, very few if any rooms will exist with no load bearing walls. Interior rooms with no load bearing walls are the safest rooms to designate as shelter-in-place locations for severe storms or tornadoes. A "load bearing wall" means a wall that actually holds up a roof. Rooms with load bearing walls should be avoided when designating a shelter in place locations. The walls of rooms with load bearing walls can blow down on residents with crushing force when the roof is damaged or demolished. Selecting a design for the structure that includes

an adequate number of interior rooms with no glass windows, doors or walls provides rapid and safe shelter locations for residents in case the facility is subject to severe storms, tornados or external toxic air release. Rooms designated as shelter locations should also have the capacity to have the outside air flow shut off. Cutting off any external air flow could be necessary if an outdoor air toxic release occurs requiring sheltering in place to protect residents.

At the time of the facility design nursing home administrators should also make sure any air cooling or heating systems selected can be shut off with easy inside access to allow a rapid response. Both the main electrical system and backup generator should be designed in case of an external air contaminant is released to shut off all air heating and air circulation systems without shutting down the facility's electrical systems for lighting and other electrical needs. When choosing emergency generators to install for a new or retrofitted nursing home facility select those that can handle a large demand for energy including heating and cooling of a majority of the facility. Place the emergency generator in a location that would not be subject to flooding and can be secured from vandalism or theft of fuel. Although it is only required to have emergency generation capacity for a few functional areas including emergency lighting, it is best practice to size a generator large enough to handle heating or cooling of at least part if not all of the facility. Having a large emergency generation capacity is important for a nursing home that may need to shelter in place from certain types of disasters because utility companies may not be able to reconnect power for 10-12 days and nursing home residents are at risk of illness or death if forced to reside in a facility that is too hot or cold (Brown et. al. 2012), (Markus et. al. 1972).

Having the capacity to maintain optimum temperatures within a nursing home is important during a utility outage because elderly residents are much more vulnerable to extended periods of hot or cold temperatures than younger individuals resulting in a major illness or death.

When determining the design for a nursing home facility it is also important to make sure plans include efficient evacuation routes from each unit within the nursing home, adequate emergency lighting and evacuation routing identification markers. Each of the design features discussed to insure emergency facility preparedness for sheltering in place and evacuation in a new facility are also critical areas to consider for repair or remodeling in existing facilities.

Facility Emergency Preparedness

Once a nursing home is in operation it is very important to implement and maintain an ongoing inspecting system to make sure all emergency preparedness systems are present and operation. One tool to use to assess ongoing preparedness is the 10 Point Emergency Preparedness Checklist. This specific checklist covers the following assessment areas: Warning Systems, Communication, Evacuation, Utilities/Electric Control, Fire Suppression, Storm/Tornado Shelter, Management Issues, Housekeeping, Bomb Threats and Security. The use of this or a similar facility checklist should be used to assess the entire facility at least once every two to three months (Smith S. M & Rogerson, 2002).

Emergency Plans, Training and Coordination

A comprehensive disaster/emergency response plan should include evacuation and shelter-in-place procedures as well as clear guidelines and key individuals that would initiate an evacuation. Not only should the plan be developed, but it must be understood by all employees and routinely carried out in training and practice scenarios (Smith S., Peoples and Council, 2005). Whether a nursing home effectively evacuated or sheltering-in-place or had problems was found by Department of Health and Human Services, Office of Inspector General in 2012 to be associated with effectiveness of emergency planning or the lack of preparedness planning. This

report found administrators and staff of specific nursing homes who did not follow existing plans or had almost no specific plans outlined had the most problems with evacuation or sheltering in place. A study by Castle in 2008 of 2,134 nursing homes found only 41% a provision related to Community Coordination including details procedures for working with local emergency manager and submitting plan. This component of active coordination is a critical function for a nursing home to maintain for the facility to successfully respond to a disaster (Smith, 2012), (Smith and Gorski, 2010), (Saliba, Buchanan, Kingston, 2004), (Dosa, 2008). Only 37% reported having a provision focused on specific resident needed including lists of resident medical and personal needs. Forty four per cent included a provision on staffing defining specific procedures to insure adequate staff for sheltering in place or an effective evacuation (pp. 1238, Castle 2008).

Deciding to Shelter in Place or Evacuation

Since Hurricane Katrina hit the Southeastern United States due to the number of deaths associated with this hurricane, Brown et. al, reported Dosa found a significant increase in the number of nursing homes evacuating if a hurricane is predicted. However, Brown further reported research by Dosa et. al. found "that evacuation, not storm effects experienced while sheltering in place, contributed significantly to increased rates of hospitalization, morbidity, and mortality of nursing home residents" (pg. 2 Brown, Lisa et. al., 2012). Further research by Brown et. al. published in 2012 found relative to two years prior to hurricane Gustav which was smaller than Katrina or Rita, nursing home residents with dementia had a "2.8 percent increase in death at 30 days and 3.9 percent increase in 90 days for residents with severe dementia who evacuated for Hurricane Gustav, controlling for resident demographics and acuity" (pg. 1, Brown et.al., 2012). Given the unpredictable nature of the path of a serious hurricane or severe storm or wild fire it is a very complex decision to determine whether sheltering-in-place or evacuating

will provide less risk to residents of a nursing home. Due to the short lead time once a natural disaster is predicted it is critical that the facility be fully prepared to either successfully shelter-in-place or evacuate. The actual decision will- depend on the availability of information on the predicted disaster, the location of the facility and the structural condition of the facility. When making decisions concerning whether to shelter in place or evacuate a nursing home facility administrator must consider many factors. These factors include: whether the nursing home facility has a safe and sufficient location for sheltering in place, adequate capacity for emergency power generation, trained staff and stored water and food. Beyond these considerations when deciding if sheltering-in-place is a good choice it is important to know the nature of the hazard. Sheltering-in-place is a viable option for tornados, severe storms and external toxic releases. Typically more information should be consider prior to sheltering in place if the hazard is related to potential flooding, fire or an explosion. In most cases residents should be evacuated when considering these hazards. As indicated earlier the evacuation can be for efficiently if the building design has effective warning systems and if personnel are well trained in full building evacuation. In addition to effective planning and practice through extensive training for resident evacuation. The evacuation will only be successful with limited or no injuries if preplanning include: a detailed plan for transportation of all residents to a relocation facility, preplanned actions to bring medicine, water and food for individual residents and adequate staff availability. Prior agreements with other facilities for relocation of residents are also critical elements to make sure an evacuation of residents is a success (Hyder et. al. Polivka-West, Brown M, 2007-2008), (Zaenger et. al., 2010).

Recommendations for Sheltering-in-Place

Check lists to determine the appropriate measures to shelter-in-place have been created (Smith and Rogerson 2002). An emergency plan must include a timeline with major actions and decisions. In a report by Zaenger et. al. 2010 entitled "Shelter-in-Place versus Evacuation Decision Making: A Systematic Approach for Healthcare Facilities," the following recommended procedures for sheltering-in-place were outlined.

- Sufficient basic (food, water, bedding, sanitary) and medical supplies are available for the duration of the expected sheltering.
- Sufficient personnel are available for the anticipated duration of an event…
- The building's systems are functional and safe (electric including backup generators, cooling/heating, telecommunication, water etc.)
- Joint Commission requirements specify that a facility must be able to stand alone for 96 hours. Administrators will need to consider contingencies if their usual sources of electricity, natural gas, water, and sewer treatment are cut off.
- The facility has adequate security personnel.
- Access to and egress from the facility is controlled.
- Continuous monitoring of the event and the facility's condition…
- Preparations are in place for an evacuation.

(Zaenger, 2010 pp. 26)

Recommendations for Effective Evacuation

In order to execute a successful evacuation resulting in the fewest casualties, all employees must know what is expected of them. They must also be educated and trained on;

- Who to evacuate first
- How to get them out
- What supplies, patient records and medications to take
- Where to assemble once out of the building
- Alternative communication
- How to keep track of patients in the event of relocation
- Have adequate and appropriate transportation to a relocation site

Professionals with the Occupational Safety and Health Administration Training Institute recommend a focus on employee safety and well-being in addition to the above mentioned points (OSHA Training Institute IX: UCSD Extension, 5-egress power point).

Pre-arranged partnerships with local agencies or first responders should also be included in the evacuation plan. It is vital to obtain and include written memorandums of agreement for emergency transportation as well as emergency relocation with surrounding agencies, organizations or individuals in the event that an off-site evacuation is necessary (Smith and Gorski, 2010), (Hyder, Brown, Christensen, and Thomas, 2009). In the United States in 2005, poor management of healthcare facility evacuation efforts reportedly contributed to a significant number of deaths: 139 nursing home residents during Hurricane Katrina, and 23 residents in a bus accident during Hurricane Rita. The 34 St. Rita's nursing home residents who drown because they were not evacuated due to lack of transportation services when hurricane Katrina hit is one example of the critical importance of pre-planning for a nursing home evacuation (Dosa, 2007).

A tragic bus accident in Texas during Hurricane Rita evacuation on the highway was also a direct result of the facility's lack of planning for safety and reliable emergency transportation;

the available bus had not been inspected for safety related issues and all passengers perished when it caught fire on the interstate (Polivka-West, 2006).

Having a detailed plan in place and being familiar with it is the most meaningful and effective course of action an organization can take in mitigating disaster related injuries and deaths (Smith, Peoples, and Council, 2005). When evacuating and/or relocating medically compromised and fragile individuals, the ease of transition has been found to be a major factor in patient survival and the overall wellness of these individuals (Office of the Inspector General, 2006). Knowing the evacuation plan and practicing it allows employees to become familiar and comfortable in their roles during an evacuation, which will result in a smoother process when an actual emergency event presents. The state of Florida has had extensive experience in this area. Florida coped with eight major hurricanes in the years 2004 and 2005, yet reported no evacuation-related deaths. In Florida in 2004, more than 10,000 residents of nursing homes, assisted living facilities, and continuing-care retirement communities were safely evacuated and in 2005, 2,997 nursing home and assisted living residents (Hyer, Brown, Berman, Polivka-West, 2006).

Specific challenges face facilities when evacuating patients which can be streamlined with a proactive approach. Such actions include but are not limited to:

- Development of a comprehensive disaster/emergency response plan specific to the facility and updated regularly
- Clearly posted and legible maps detailing evacuation routes posted throughout facility
- Appropriate signage, such as reflective directional arrows, along exit routes
- Routinely drill for emergency situations
- Maintain a cache of emergency supplies in a central and easily accessible location

It is also critical that once a structure or situation becomes unsafe, the evacuation begin immediately. Because a single emergency event can easily produce secondary emergency events, which become additional life-threatening obstacles, delaying evacuation may make it more difficult and more dangerous. Earthquakes, for example, can result in loss of power, unstable structures, and fires, all of which are detrimental to the functioning of a medical facility and further impede evacuation efforts (Tumosa N. 2007).

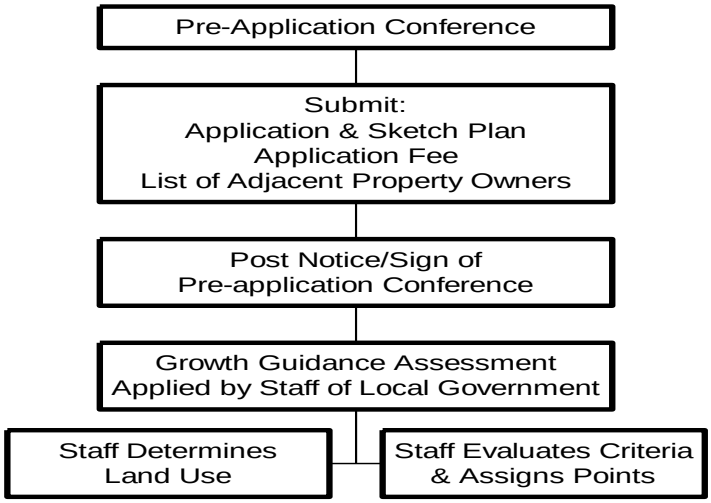
After evaluating and analyzing national survey data in the United States, the Office of the Inspector General (2012) recommends that healthcare facilities use the Centers for Medicare & Medicaid Services (CMS) issued guidance checklist for emergency planning. Use of this list will prevent many of the complications that accompany lack of preparedness and partnerships. The OSHA Training Institute has also developed educational training tools for emergency preparedness in hospitals and nursing homes, which is available on their website at www.osha.gov.

Summary

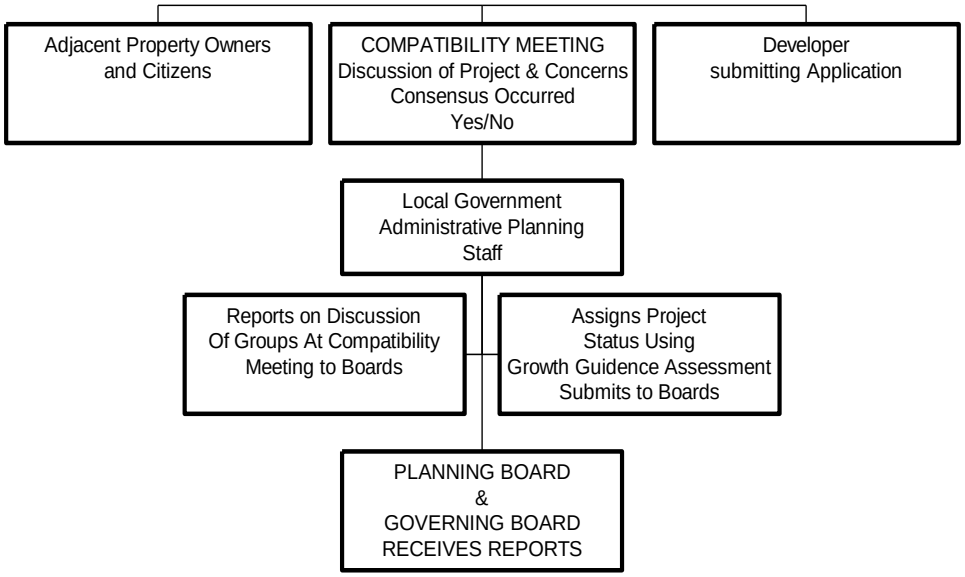
Emergency preparedness and preparation is essential for a nursing home facility to effectively evacuation and sheltering-in-place. Each facility must always insure that the staff and facility are prepared for an emergency. These actions include keeping the facility's plan up to date, maintaining continuous training and conducting full scale drills. When planning to shelter-in-place a nursing home facility must plan in advance to have sufficient back up electric power, staffing, stored water, food and supplies including linen (Hyder, Polvka-West, Brown 2007-2008) (Ladika et., 2008), (Zaenger, D. et.al., 2010). Key elements to implement when planning to successfully evacuation are adequate transportation vehicles, staff, portable medical supplies, water and food as well as an agreement with an appropriate facility for relocation (Dosa, 2008),

(Castro et. al. 2008) (Hyder et. al. 2009). The use of the 10 Point Emergency Preparedness Facility Check List or a similar facility checklist at least five times a year can also allow an administrator to quickly recognize and repair or modify any problems with the facility's emergency preparedness systems. Maintaining coordination within the facility and between the facility and the community are both important factors in supporting the facility's effective ability to evacuate or shelter-in-place.

The Land Use Guidance System
Step One Figure 1.
(Smith, 2001)



The Land Use Guidance System
Step Two Figure 2.
(Smith, 2001)



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