

RENAL BUSINESS TODAY

The Critical Importance of Dialysis Unit Patient and Staff Properly Preparing For a Disaster Cannot Be Overstated

By Gordon Lore

It was 4:31 a.m. on January 17, 1994, when the ground began to shake, rattle, and roll under and around the apartment building where my wife and I lived in Burbank, California. Books, records and delicate items crashed to the floor and our cats were nowhere to be found. The lights went out as the building continued to shake, then settled down to a low rumble. It was a scary 20 or so seconds. The question we both silently asked was: “Is this the Big One?”

Not quite. But, at 6.8 on the Richter scale, it wasn't all that much below the 8.0 considered to be among the most damaging temblors. It was big enough to be the cause of at least 33 deaths, with more than 8,700 people injured. Road bridges and highway overpasses buckled.

My thoughts quickly turned to the thousands of dialysis patients in clinics throughout the Los Angeles basin that had to be affected. As the editor of *Contemporary Dialysis & Nephrology* and *For Patients Only*, I was anxious to get to my desk and begin calling facilities in the area to determine how patients and staff may have fared.

I spoke with the Administrator of a dialysis clinic very near the epicenter of the quake in preparation for a cover article on the temblor. I was asked to come right over. As I entered the clinic, there were a few patients milling about. Only one individual appeared to be having a dialysis treatment. Equipment and supplies littered the floor. Machines were damaged. Shelves and other equipment had not been properly attached and had crashed to the floor. I was told that patients had been wandering about in the darkness of early morning, unsure as to whether or not they would have access to their chairs. They appeared to be unaware as to where to go or how to get there. None of them remembered the last time there was a fire or earthquake drill. A few told me that it was only by the grace of God that no patients were seriously injured or killed. Other patients said they had never been aware of any evacuation plans, and the few cursory emergency notices were nailed in back work areas accessible only to employees.

This dialysis center, part of a chain of renal care providers, had a very good reputation in caring for its patients. Nonetheless, from that one visit, it was obvious to me that the staff or patients were not really prepared for a potential disastrous event. I wondered how many other units needed to seriously upgrade their disaster preparedness plans.

Patients Are Unprepared

Flash forward to 2011. A study by young researchers at the University of North Carolina School of Medicine published in the September issue of the *Clinical Journal of the American Society of Nephrology* stated that “most patients are not prepared to effectively handle man-made or natural disasters.” The researchers contacted 311 patients receiving care at dialysis facilities in central North Carolina. Their findings included:

- While the dialysis centers had a disaster preparedness program on their books, “most patients were not well-prepared for a disaster.”

- Less than one-half (43%) of the patients were aware of alternative dialysis facilities where they could go for treatment.
- Only 42% had medical records at home they could quickly take with them.
- Only four of 10 patients “had discussed the possibility of staying with a friend or relative during a disaster.”
- A low 15% of patients had an ID necklace or medical bracelet they could wear when evacuating their homes.
- The results, however, were a little better for patients forced to remain in their homes. More than one-half (57%) knew about the three-day emergency diet while 63% said they had a two-week supply of extra medications.

Sage Advice

Early in 2007, I worked with both Paul E. Miller, MD, and Jeffrey B. Kopp, MD, FASN, CAPT, USPHS, for an article on dialysis patients and emergency disaster planning that was published on the *KidneyTimes*TM web page. Both men worked to develop a field hospital and aid in the assistance to dialysis patients in the wake of the disastrous Hurricane Katrina. These hard-working, conscientious professionals had some sage comments and advice that are worth repeating here.

“Every region of the country is at some risk for natural and man-made hazards... and acts of terrorism,” they wrote. “Therefore, it is incumbent on all dialysis patients in every region of the country to prepare for disasters. Patients have many potential sources of help when developing individualized disaster plans... Patients... need help to enlist their family and friends in the planning process and use these resources to help with transportation and access to care... Other potential sources of help include the local ESRD Network; kidney patient and faith-based

groups; fraternal, service, and veterans' organizations; and similar community groups.”

Hurricanes

Hurricanes are violent storms with fierce rain and winds blowing at 75 m.p.h. or higher. They bring storm surges, floods, coastal land erosion, landslides, even tornadoes. Residents of the Atlantic and Gulf Coast states are most vulnerable and must be prepared. The season runs from June through November with most of the bigger storms occurring from mid-August to late October.

What can dialysis patients, unit staff members and their families do if a major hurricane strikes? They can:

- Contact their local emergency management office for information about evacuation routes and other safety plans.
- Obtain information from such sources as the Federal Emergency Management Agency (FEMA), Ready Campaign, Citizen's Corps, American Red Cross, and the National Oceanic and Atmospheric Administration's (NOAA) National Hurricane Center.
- Obtain flood insurance at least 30 days before a hurricane strikes. Remember that a general homeowner's policy does not cover floods.
- Prepare a family disaster plan with out-of-town contacts and locations so your family and friends can be reunited if they are separated.
- Build a disaster kit with whatever you may need to survive for at least three days.
- Store essential documents in a fire- and flood-resistant location or safety deposit box.

Inadequate Preparation

There is a lot that needs to be done in the event of a hurricane or other disaster. And *dialysis facilities need to be better prepared*. Robert J. Kenney, MD, Renal Associates of Baton Rouge, LLC, Louisiana, became acutely aware of this following the disaster in New Orleans and other areas in Louisiana in August of 1995.

“The scope of the damage from Hurricane Katrina... was such that most of the preparedness at the local, state and federal levels, much less than of a private facility..., [was] rendered woefully inadequate...,” he remarked in his presentation at the Annual Meeting of the American Society of Nephrology, San Diego, California, November 14-19, 2006. “One month later in Louisiana alone, 26 of the 43 dialysis facilities... closed by the storm remained unopened.”

Despite such concerns, however, Gulf Coast clinics battered by the hurricanes pulled what resources they had together and worked around the clock to continue providing dialysis services. Some stations were even able to open within 24 hours of the storms.

The Kidney Care Council (KCC) was impressed by the quick and effective action by patient caretakers, saying that “dialysis providers have made significant strides to repair and rebuild facilities serving tens of thousands of ESRD patients along the Gulf Coast.” Besides establishing toll-free numbers for patients and providers, KCC members also worked to provide every city, county and state Director of Emergency Management contact information for every dialysis facility in their jurisdictions in order to coordinate their emergency management plans.

KCER has also announced that the www.dialysisunits.com website now includes “both traffic pattern and surge capacity upgrades” containing real-time information on the traffic flow around a specific dialysis clinic. The surge capacity feature “allows authorized users to post the number of available dialysis chairs... prior to and after an emergency/disaster.”

In 2011, the US was particularly prone to “disasters of all forms.” This pointed out the urgent need for both organizational and personal preparedness. National Preparedness Month was September 2011, with the theme “A Time to Remember, A Time to Prepare,” coinciding with the 10th anniversary of the infamous terrorist attacks on September 11, 2001. The theme reiterated that “being disaster ready is essential for each ESRD network, provider and patient.”

Evacuation Tips

Patients and providers should also know not only the best way to evacuate an area during and following a disaster, but *when* to do so as well. Besides the disruption of such services as utilities, transportation, and communication, critical infrastructures such as freeways and bridges could also be knocked out. Dialysis providers and patients should take these issues into consideration when deciding on the best time to evacuate an area.

There are at least two main kinds of evacuation shelters under the headings of “general population” and “special needs.” These shelters are frequently set up in convention centers, sports stadiums and arenas, and school buildings/gymnasiums. And “some states may offer special-needs shelters that are designated to receive dialysis patients.” Other possible shelters include the homes of families and friends.

Water Treatment

Making sure that a dialysis facility's water treatment system is safe during and after a disaster is not only crucial. It is critical and should be coordinated well in advance of any potential disaster.

The Centers for Disease Control and Prevention (CDC) has some technical guidelines on what should be done “when bringing hemodialysis [HD] facilities' water systems back on line after a disaster,” including:

- Flushing stagnant water from the system;
- Testing free chlorine and chloramines levels;
- Increasing the frequency of monitoring chlorine, chloramines, water quality and endotoxins;
- Drawing water culture and endotoxin tests;
- Rinsing and disinfecting the reverse osmosis (RO) distribution system(s);
- Replacing cartridge filters;
- Comparing the water quality readings to the historical data of the unit;
- Watching for “an increased level of particulate matter in the water”;
- Planning to re-bed the carbon tanks;
- Sending a product water sample to the Association for the Advancement of Medical Instrumentation (AAMI) for an analysis; and
- Thoroughly cleaning the RO membranes.

Two of the water treatment references dialysis unit staff can contact are:

- (1) AAMI, Recommended Practices for Dialysis Water Treatment Systems (RD 52 and RD 62). URL:
<http://aami.org/publications/standard/dialysis.html>.
- (2) Northwest Renal Network. Monitoring Your Dialysis Water Treatment Systems. URL:
www.nwrenalnetwork.org/watermanual.pdf.

Getting Off the Dialysis Machine

One important, very critical lesson that clinical staff should convey to dialysis patients is instructing them on how to get off their dialysis machines in the event that staff members are not available during a disaster. This includes how to:

- Locate the emergency disconnect packet attached to the side of each dialysis machine and follow its instructions.
- Clamp the access needle and thicker blood lines and disconnect them from the needles. Pinch all four clamps closed.
- If lines *must* be cut, *cut only the thicker blood lines*. NEVER cut the vascular access needle line. And **NEVER, NEVER** cut between the clamp and the access. If you do, the patient will probably bleed to death.
- Tie down and leave the needles in place until the patient can return.
- To guard against blood clotting, it may be necessary for staff and/or patients to hand crank blood pumps if power fails. Turn the crank in the direction of the blood flow. Crank S-L-O-W-L-Y and for no longer than 10 minutes. Following the 10-minute period, return the blood per unit policy.
- Check blood lines for air or foam.

- Never allow someone to inject medication into a patient's vascular access or place anything on it.

Home Patients

Patients who are on continuous ambulatory peritoneal dialysis (CAPD) and continuous cycling PD (CCPD) at home should:

- Maintain a two-week stock of updated PD supplies;
- Have on hand a five-day supply of the antibiotic for peritonitis; and
- Register with local water and power companies.

The Home Dialysis Center (HDC) has some helpful information for patients who dialyze at home. The Center believes that these patients will be ahead of the game if they gather their vital documents and place them where they can grab them in a hurry. And *always be sure your clinic knows how to reach you.*

The experts at HDC stressed that, if patients have PD or home HD supplies on hand, they are in luck because “being able to do treatments at home in an emergency is one of the unsung benefits of home options. In the Kobe, Japan, earthquake of 1997, PD patients fared far better than those who were doing in-center hemodialysis.” The HDC suggests that home patients build an emergency kit and gather the following and other items that may be needed:

- Flashlight and batteries;
- A battery-operated or hand-cranked weather band radio;
- At least one week supply of medications;
- Diabetic supplies;

- A first-aid kit;
- Chemical hand warmers;
- Paper and plastic meal supplies;
- Scissors;
- Sharp knife;
- Can opener;
- Trash bags; and
- Iodine or bleach for purifying water.

PD patients should also have on hand “five cases of solutions, one case of lines and caps, betadine and hand sanitizers [and] extra batteries for [the] blood pressure monitor.” Home HD patients will also need a week’s amount of dialyzers or cartridges, saline bags, needles, scissors, tapes, syringes, bandages, heparin, gloves, hand sanitizers and medications. All home PD and HD patients should consider having backup power available. If there is no power at all, PD patients can do their own treatments by hand.

Additional advice includes:

- If home patients cannot stay at home and have enough warning of an impending disaster, they need to fill their cars with gas and formulate evacuation plans, “keeping in mind that bridges, trees or power lines may be down.”
- Patients without transportation can ask their dialysis units for assistance.
- Keep track of TV and/or radio weather bulletins.
- Discover where shelters are located.
- PD patients should also remember that if they “cannot find a clean room for exchanges, *don’t do them.*” The risk of

peritonitis is higher than the risk of not doing PD for up to a full week.

- Always follow the emergency dialysis diet plan.

Is Terrorism a Threat?

The threat of terrorism on American soil was tragically brought home by the attacks on New York City and Washington, DC, on September 11, 2001. While dialysis patients are currently not deemed to be high on the list of potential targets for terrorists, Sarah Yelton, RN, CNN and Cathy Long, BA, RHIT, still believe that some planning should be done by dialysis unit administrators. In October 2001, about a month after the deadly attacks, they wrote a paper for the Heartland Kidney Network entitled “The Threat of Terrorism. How Could it Affect Dialysis Facilities?”

“Each dialysis facility is encouraged to formulate unit specific anti-terrorism and terrorism survival planning,” they wrote.

The network officials noted that car bombs, small and large bomb blasts, and chemical and biological attacks “could potentially affect a dialysis facility.” They also said that “most dialysis facilities have a bomb threat policy in place already. Take all threats seriously.” The authors added that “computer databases can be disrupted or disabled by... virus attacks” and recommended that facilities frequently update their virus protection programs.

Mitigation and Preparedness

Plans to mitigate (implementing policies to help lessen the negative impact of a disaster) and prepare for an emergency is a necessary ingredient in the protection of dialysis patients and staff. Preparedness is

a process that “includes delivering tasks and activities to build, sustain and improve the facility’s operational capability to prevent, protect against, respond to and recover from emergencies.”

The Kansas Department of Health and Environment has a comprehensive “Emergency Management Plan For Kansas Chronic Dialysis Facilities.” It includes such topics as clinic building locations, exits, shutting off utilities, water hydrants, main water valve, water lines, sprinklers, gas lines and main valves, electrical and main stations and substations, storm drains, sewer lines, alarms and enunciators, floor plans, fire extinguishers, virus suppression systems, elevators, stairwells, evacuation routes, storing of hazardous materials, and locations of high value items and safety equipment such as emergency supplies, tools and first-aid kits and dialysis chairs.

Fire Hazards

Fires are among “the most common of hazards,” which can include extensive flames, smoke and water. The resulting soot and ash are “extremely corrosive and can damage sensitive equipment” quickly. Facility staff members should maintain contact with the local fire department about response capabilities.

A facility’s emergency management plan should establish procedures for:

- Safely storing flammable liquids and gases;
- Preventing the buildup of combustible materials;
- Keeping equipment operating safely;
- The appropriate spots for fire extinguishers;
- Ensuring that key personnel become familiar with all fire safety systems;

- Identifying and marking all utilities so staff can quickly shut off electrical power, gas or water;
- Reporting emergencies to the proper local authorities; and
- Designating post-disaster evacuation routes and offsite meeting locations.

Dialysis clinic staff should also be educated on:

- Preventing fires in the workplace;
- How to contain a fire and evacuate the facility;
- Where to report a fire; and
- Asking their insurance carrier to recommend “fire prevention and protection measures and if the carrier offers any training.”

Winter Storms

The onslaught of severe winter storms often brings heavy snow, ice, strong winds and freezing rain. They can prevent patients and employees from reaching their facilities, which can lead to a temporary shutdown until roads are cleared. Ice and snow may cause power outages and structural damage. And “winter storms may also require employees and patients to seek shelter in the facility until the immediate threat has passed.”

Preparing for a severe winter storm is much the same as getting ready for any other disaster. Preparations may include:

- Listening to the NOAA Weather Radio and local radio and TV stations for weather updates;
- Assessing the necessary supplies well before the winter season starts;
- Establishing procedures for facility shutdowns;

- An emergency survival kit for at least three days or more;
- Arranging for cleanup; and
- How to communicate to patients and staff that the facility is—or is not—operating.

Tornados and Earthquakes

There are a number of things that can be done to mitigate damages during tornado or earthquake alerts, including:

- Bolting water heaters, fragile cabinets and storage shelves to the walls;
- Raising computer work stations above possible flood levels away from large windows;
- Securing light fixtures and other equipment that could move, fall or shake loose;
- Bracing water heaters;
- Securing tall items or those near exits;
- Moving heavy, large objects to lower shelves on the floor away from workplaces;
- Securing other such items as shelves, furniture, copiers, printers and desktop equipment;
- Installing safety glass;
- Locking dialysis and portable RO machines; and
- Compiling a photographic inventory of vital equipment.

Hazardous Materials

There are many local, state and federal regulations regarding the care and handling of hazardous materials and other chemicals, including an Occupational Safety and Health Administration (OSHA) regulation entitled “The Worker’s Right to Know.” This and other similar

documents could be particularly important for dialysis center staff during earthquakes, tornadoes, fire and flooding.

One important reason dialysis facility staff should be knowledgeable about these safety measures is because blood and bodily fluids are considered as hazardous materials and are covered under an OSHA federal standard labeled Blood-Borne Pathogens.

Safeguarding Important Records and Equipment

During a disaster, important, even vital, records may be badly damaged or destroyed. These include patient files, site maps and/or blueprints, financial and insurance information, product lists, databases and directories, vendor contracts, and personnel files, among others. Critical patient and business documents should be backed up electronically. Many of these and other documents can be kept in a strong, portable, waterproof emergency “box.”

Other records should include such items as:

- A Medical Evidence Form (CMS 2728);
- An updated history of medical problems;
- A list of medications, doses, and drug allergies;
- HD orders;
- Dry weight estimate;
- An admittance fact sheet;
- Advance Directives;
- Dietary plans;
- Flow pattern schematic of the water treatment system;
- Schedule of patient and staff shifts;
- Patient and staff phone numbers;
- Mutual aid agreements; and
- Service providers.

The Importance of Communication

Some experts believe that communication is often the weakest link in any plan, but “may be the most important during any emergency.” Communications with patients and staff should be established quickly, but no longer than 12 hours following the event, if at all possible.

Other resource strategies may also include:

- E-mail;
- Personal message deliveries;
- Two-way radios (walkie-talkies);
- Hand cranked radio;
- Pagers;
- Mass mailings; and
- Distributing flyers and posters.

Also bear in mind that such networking Internet sites as My Space, Spacebook, and Twitters are gaining popularity as alternative methods for sharing information. There is a website program that can be accessed through the American Red Cross known as the “Safe and Well List.” This list enables individuals “to exchange welfare information with family members and friends in the aftermath of a disaster.” All these could be useful resources for dialysis facilities in the event of a disaster.

Other resources include an identification card to “assist patients with having critical information on-hand in case of an emergency.” It helps patients and dialysis providers locate help during and after a disastrous occurrence. This card would be particularly helpful if a patient has to evacuate to another area or is unable to return home or to his/her dialysis unit. The lavender cards should be carried by the patient at all times. The Texas ESRD Emergency Coalition Patient Identification/Database has also developed a lavender “Get Branded!!!” wristband to identify patients during a mandatory emergency evacuation.

ESRD Network Contract

Effective on July 1, 2006, clear responsibilities in disaster planning became a part of the 18 regional ESRD Networks contract following a mock emergency drill in June to ensure that the Networks “were prepared to satisfactorily fulfill their responsibilities.”

The Networks were required to:

- Assist providers/facilities in developing local disaster plans;
- Track and make public the open and closed status of area clinics; and
- Distribute educational materials and the necessary tools in preparing for a disaster as well as what patients and staff can do during an emergency.

Conclusion

The period dating from Hurricane Katrina through 2011 has been one of the most dangerous, costly, and prolific times in recorded history for weather-related and other natural disasters. Katrina and Hurricane Rita “resulted in massive destruction of the healthcare infrastructure, including dialysis units, across the Gulf region.” While metropolitan New Orleans was particularly hard hit due to its population density, the patient vulnerability to such disasters was most evident among those with chronic diseases such as ESRD, and elderly and minority populations.

While Hurricanes Katrina and Rita tragically pointed out the dangers to vulnerable patient populations from weather-related events, such other natural disasters as earthquakes, tornadoes, floods, fires and winter storms have also been significant contributors to the problem. Together,

they have highlighted the urgent need to continue building upon existing guidelines to better care for such chronically ill patients as those with kidney disease.

References

- www.kidneyfund.org/news-releases/akf-disaster-relief-program.html.
- www.cdc.gov/niosh/topics/emres/sitemgt.html.
- www.bt.cdc.gov/disasters/watersystems.asp.
- www.kcercoalition.com/pdf/Disaster_Preparedness_-_A_Guide_for_Chronic_Dialysis_Facilities_-_Second_Edition.pdf.
- <http://consumer.healthday.com/printer.asp?AID=656110>.
- www.davita.com/kidney-disease/overview/living-with-ckd/emergency-preparedness-for-people-with-kidney-disease/e/4930.
- Dialysis Disaster Preparedness. Renal Business Today, May 1, 2008.
- www.dialysispatients.org/emergency-and-disaster-preparedness-for-dialysis-patients.
- http://mg.en25.oom/Web/SungGArp/Forrester_wake_up_call_you_arent_ready_for_disaster.pdf.
- E-mail interview with Seth Holloway, MPH, CPH, Emergency Management Specialist, Kidney Community Emergency Response (KCER) Coalition and FMQAI, the Florida ESRD Network, Tampa, October 24, 2011.
- www.fema.gov/pdf/hurricane/2010/hurricane_week_preparedness_factsheet_ready.pdf.
- Kenney, Robert J., MD, Renal Associates of Baton Rouge, Louisiana. Emergency Preparedness Concepts for Dialysis

Facilities: Reawakened after Hurricane Katrina. Presentation given at the Annual Meeting of the American Society of Nephrology, San Diego, CA, November 14-19, 2006.

- www.kidneycarecouncil.org/disaster_preparedness.html.
- www.kidney.org/help/.
- www.nraa.org/Documents/Disaster/CoalitionFinalReport.pdf.
- www.kcercoalition.com/lavender.htm.
- www.nephrologynews.com/print.aspx?articleid=6242.
- www.kcercoalition.com/.
- www.kcercoalition.com/resources.htm.
- www.kcercoalition.com/Networks.htm.
- www.kcercoalition.com/ CPP.htm.
- <http://onlinelibrary.wiley.com/doi/10.1111/j.1542-4758.2007.00227.x/abstract>.
- www.ncbi.nlm.nih.gov/pubmed/17699500.
- http://kidneytimes.com/article_print.php?id=200700207143124.
- www.nraa.org/Disaster_Prep.php.
- [www.nephrologynews.com/disaster-management/article/emergency-preparedness-for-people-with-kidney -disease](http://www.nephrologynews.com/disaster-management/article/emergency-preparedness-for-people-with-kidney-disease).
- <http://nephron.org.nephsites/nic/cms72606>.
- <http://kidneydiasters.org/>.
- Renal Business Today. Dialysis Disaster Preparedness, May 1, 2008.
- www.therenalnetwork.org/services/disasterplan.php.
- www.renalspecialists.com/.
- www.texasemergencyesrd.org/tools/wristband.asp.

- http://en.wikipedia.org/wiki/1994_Northridge_earthquake.
- www.network12.org/community/download/threat_of_terrorism_files/slide0001.htm.

G*ordon Lore is the former Editor of Contemporary Dialysis & Nephrology and the Founding Editor of KidneyTimes and Nephrology Incite. He was also nominated for the American Association of Kidney Patients' first annual Medal of Excellence for his effort to aid dialysis and renal transplant patients as Editor of For Patients Only.*