Topic Collection: Dialysis Centers

Disasters can significantly impact patients who are being treated with maintenance dialysis in several ways. For one, structural damage to dialysis and healthcare facilities can hamper a patient’s access to their treatment site, which can also cause a delay in the receipt of treatment. Disasters may also impact water supply, leading to “boil water advisories.” This may affect a facility’s ability to provide safe dialysis treatments to their patients. When disasters strike, dialysis and healthcare facilities will need time to recover from the damage. This includes staff who may have been affected by the disaster and are challenged in their ability to report to work. These resources highlight lessons learned from recent events, information on dialysis center recovery, strategies for post-disaster dialysis patient care, and plans, tools, and templates that can be modified to suit facility-specific needs.

Each resource in this Topic Collection is placed into one or more of the following categories (click on the category name to be taken directly to that set of resources). Resources marked with an asterisk (*) appear in more than one category.

Must Reads
Dialysis Center Recovery
Event-Specific Lessons Learned
General Resources
Patient Care
Patient Resources
Plans, Tools, and Templates
End Stage Renal Disease Networks
Agencies and Organizations

Must Reads

Centers for Disease Control and Prevention. (2014). Dialysis Care After a Disaster.

The Centers for Disease Control and Prevention provides links to information on post-disaster dialysis care, including bringing water systems back on line after a disaster, using "tanker water" for dialysis, and how to handle "boil water advisories."


This emergency operations plan manual includes emergency management templates that can be tailored to the needs of dialysis facilities.
The author identifies and discusses the five steps a dialysis clinic should take to ensure their water systems are safe and functional after a disaster.


The authors analyzed more than 175 questionnaires submitted by hemodialysis clinics to better understand how they handled the power outage that followed the 2011 earthquake and tsunami in Japan. Nearly all of the clinics reported that they had established procedures to deal with future planned outages and nearly as many reported implementing lessons learned just after the disaster struck.


The authors of this study address the variation in dialysis care patterns and mortality for patients with end stage renal disease in New York City and the State of New Jersey after Hurricane Sandy. They discuss their findings and conclude that members of the study group (those living in areas affected by Sandy) had higher rates of post-storm visits to the emergency department, hospitalizations, and 30-day mortality than members of the comparison groups.


This facility-specific emergency operations planning template can be customized by dialysis facility staff.


The authors share the story of a peritoneal dialysis center's experience with Hurricane Katrina, from the planning, response, and follow-up phases of the event.


The authors of this article review the disaster-specific patient care recommendations that have been put forward by the Kidney Community Emergency Response Coalition. They also provide a detailed overview of the disaster planning process from the perspectives of
kidney patients, dialysis facilities, and volunteer nephrology professionals who may participate in disaster relief.


The authors review lessons learned after recent disasters and provide "the cardinal features of kidney failure disaster preparedness."


The authors share resources on a wide range of topics for patients with kidney disease to consider in preparation for various types of disasters.


Preparing Emergency Personnel in Dialysis is a just-in-time training program that aims to teach those with minimum familiarity with basic dialysis to support dialysis staff during a disaster. The authors pilot tested the curriculum and found a nearly 30% improvement in knowledge as a result of the program.

**Dialysis Center Recovery**


The author provides a timeline of events from an earthquake that struck New Zealand, and discusses how the event impacted dialysis centers.

Centers for Disease Control and Prevention. (2014). *Dialysis Care after a Disaster*.

The Centers for Disease Control and Prevention provides links to information on post-disaster dialysis care, including bringing water systems back on line after a disaster, using "tanker water" for dialysis, and how to handle "boil water advisories."


The author identifies and discusses the five steps a dialysis clinic should take to ensure their water systems are safe and functional after a disaster.

The authors of this study discuss the nuclear power plant accident and the impacts it had on hemodialysis facilities. They discuss their methodological approach and their findings and emphasize In conclusion, the need to clarify the maximum safety level of radiation in dialysate for chronic hemodialysis patients.


The goal of this study was to highlight the challenges associated with damage to water supply facilities (including dialysis centers) in Japan after the 2011 earthquake and tsunami.


This report includes steps facility staff can take to reopen clinics after water or power outages.

**Event-Specific Lessons Learned**


The authors examined how power outages in Washington, DC, and five counties in West Virginia and Maryland impacted operations in a sample of hemodialysis centers.


The authors used a qualitative, interview-based method to study medical surge strategies used at hospitals receiving patients from evacuated healthcare facilities during and after Hurricane Sandy. One gap noted was a challenge associated with the increase in the number of dialysis patients.

In this letter to the editor, the authors refer to the "dialysis refugees" that emerged as a result of the power outages after the 2011 earthquake and tsunami that struck Japan. They note the need for centers, as well as patients, to plan for future outages.


The authors interviewed dialysis patients and listed the reasons they provided for missing sessions after Hurricane Katrina. As a result, the authors stress the need for emphasizing patient awareness and activating emergency plans early in the response phase.


The author provides a timeline of events from an earthquake that struck New Zealand, and discusses how the event impacted dialysis centers.


The authors discuss their study findings, one of which is a positive association between psychiatric symptoms in the year after Hurricane Katrina and hospitalization and mortality in patients with end-stage renal disease.


The authors investigate the impact of the 2011 earthquake on laboratory findings in chronic hemodialysis patients in Fukushima whose treatment was shortened for up to an hour after the disaster. Results indicated that treatment duration can be decreased without significantly affecting laboratory findings.


The authors used various tools to measure hemodialysis patients' psychosocial status after Hurricane Katrina. Results suggest the need for more screening and management of psychosocial issues in these patients after disasters.

The authors analyzed more than 175 questionnaires submitted by hemodialysis clinics to better understand how they handled the power outage that followed the 2011 earthquake and tsunami in Japan. Nearly all of the clinics reported that they had established procedures to deal with future planned outages and nearly as many reported implementing lessons learned just after the disaster struck.


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The authors share the story of a peritoneal dialysis center's experience with Hurricane Katrina, from the planning, response, and follow-up phases of the event.


The authors of this article review the recommendations that have been put forward by the Kidney Community Emergency Response Coalition. They also provide a detailed overview of the disaster planning process from the perspectives of kidney patients, dialysis facilities, and volunteer nephrology professionals who may participate in disaster relief.

While the authors did not find a significant relationship between Hurricane Katrina and the mortality rate of dialysis patients, they emphasized the need for ongoing disaster education.


The authors review lessons learned after recent disasters and provide "the cardinal features of kidney failure disaster preparedness."


The authors conducted a retrospective study on hospital dialysis services provided after Hurricane Sandy. They found challenges with the following: lack of documentation from transient dialysis patients, staff shortage, staff transportation, and communication with other agencies.


The goal of this study was to highlight the challenges associated with damage to water supply facilities (including dialysis centers) in Japan after the 2011 earthquake and tsunami.


The authors reviewed resources from multiple healthcare databases, along with real-life experience treating chronic disease after disasters. In their data gathering process, they found that the international nephrology community formed an effective organization (the Renal Disaster Relief Task Force), which emphasizes the need for patients to have emergency diet and renal fluid restriction plans and be prepared to modify dialysis schedules and methods. Suggestions for facilities are also provided.

This paper details the experiences of the author, a nurse unit manager, in 2011 when working for four days in the Wesley Hospital, located on the (then-flooding) Brisbane River.


The authors share information about two storms that affected Japan's Amami-Ohshima island's dialysis treatment centers. The author’s report that communication and transportation proved to be challenging, but responders reallocated patients, changed dialysis schedules, and used a satellite phone to communicate.

**General Resources**


The authors note that dialysis patients are particularly vulnerable to disaster and sought to study their levels of preparedness. They found that in general, dialysis patients were not prepared for critical incidents, regardless of demographic characteristics.


This brochure highlights important facts regarding dialysis patients and facilities for emergency planners.


This report is a summary of the progress made by workgroups formed during the 2006 Kidney Community Emergency Response Coalition's January Disaster Summit. Information is categorized by group (patient assistance, coordination of staff and volunteers, physician assistant, vendor services, facility operations, patient provider tracking, federal response, and communications).

Preparing Emergency Personnel in Dialysis is a just-in-time training program that aims to teach those with minimum familiarity with basic dialysis to support dialysis staff during a disaster. The authors pilot tested the curriculum and found a nearly 30% improvement in knowledge as a result of the program.

**Patient Care**


The authors of this paper discuss how disaster planning by dialysis centers, providers, and patients can help improve outcomes during a disaster, particularly in disadvantaged areas.


Healthcare providers can use the information on this web page to assess steps to take when treating dialysis patients during a boil water advisory.


This resource can be used to help medical professionals safely perform renal replacement therapy in critically ill patients infected with Ebola.


The authors of this article review the recommendations that have been put forward by the Kidney Community Emergency Response Coalition. They also provide a detailed overview of the disaster planning process from the perspectives of kidney patients, dialysis facilities, and volunteer nephrology professionals who may participate in disaster relief.


Patients who are dialysis-dependent (with end-stage renal disease [ESRD]) are at particularly high risk after disasters. Dialysis may be delayed and the authors write that few physicians are experienced or trained in the nondialytic management of ESRD.
Strategies such as dietary restrictions, potassium removal via resins and cathartics, and adaptations of acute treatment can help patients who cannot receive dialysis. The authors emphasize the need for medical facilities to plan and stockpile medications such as Kayexalate to help minimize morbidity and mortality.

**Patient Resources**


DaVita shares emergency preparedness information for patients on dialysis to ensure they can receive necessary treatment or lessen the impact of missing a dialysis session.


The authors note that dialysis patients are particularly vulnerable to disaster and sought to study their levels of preparedness. They found that in general, dialysis patients were not prepared for critical incidents, regardless of demographic characteristics.


The authors share tips that are useful for people with kidney disease to consider in preparation for various types of disasters.


This 10-second (un-narrated) video emphasizes the point that dialysis patients should learn more about early treatment before a storm or other type of critical incident.


This 10-second (un-narrated) video encourages dialysis patients to ask their provider about receiving treatment before a storm strikes.

**Plans, Tools, and Templates**


This emergency operations plan manual includes emergency management templates that can be tailored to the needs of dialysis facilities.

This guidance covers general emergency management planning by phase and includes suggestions specific to chronic dialysis facilities.

*DaVita. (2015). *Emergency Preparedness for People with Kidney Disease.* (Includes basic kit information and "The 3-day emergency diet.")

DaVita shares emergency preparedness information for patients on dialysis to ensure they can receive necessary treatment or lessen the impact of missing a dialysis session.


Healthcare professionals can use this tool to measure patients’ glomerular filtration rates (i.e., kidney function).


This facility-specific emergency operations planning template can be customized by dialysis facility staff.

**End Stage Renal Disease (ESRD) Networks**

The following is a list of ESRD networks and the states they serve.

Network 1 (CT, ME, MA, NH, RI, VT): [*End-Stage Renal Disease Network of New England.***

Network 2 (NY): [*End-Stage Renal Disease Network of New York.***

Network 3 (NJ, PR, U.S. VI): [*Quality Insights (Renal Network 3).***

Network 4 (PA, DE): [*Quality Insights (Renal Network 4).***

Network 5 (MD, VA, WV, District of Columbia): [*Mid-Atlantic Renal Coalition.***

Network 6 (NC, SC, GA): [*Southeastern Kidney Council, Inc.***

Network 7 (FL): [*FMQAI Network 7.***

Network 8 (AL, MS, TN): [*Network 8, Inc.***

Networks 9 (IN, KY, OH) and 10 (IL): [*The Renal Network (ESRD Networks 9 and 10).***

Network 11 (MI, MN, ND, SD): [*Renal Network 11.***

Network 12 (IA, KS, MO, NE): [*Heartland Kidney Network.***

Network 13 (OK, AR, LA): [*End-Stage Renal Disease Network 13.***
Network 14 (TX): End-Stage Renal Disease Network of Texas.

Network 15 (AZ, CO, NM, NV, UT, & WY): InterMountain ESRD Network, Inc.

Network 16 (AK, ID, MT, OR, WA): Northwest Renal Network.

Network 17 (AS, Guam, HI, Marianna Islands, Northern CA): Western Pacific Renal Network, LLC.

Network 18 (Southern CA): ESRD Network 18 of Southern California.

**Agencies and Organizations**

**Note:** The agencies and organizations listed in this section have a page, program, or specific research dedicated to this topic area.

- American Society of Nephrology. [https://www.asn-online.org/](https://www.asn-online.org/)
- Centers for Medicare and Medicaid Services End Stage Renal Disease Center. [http://www.cms.gov/Center/Special-Topic/End-Stage-Renal-Disease-ESRD-Center.html](http://www.cms.gov/Center/Special-Topic/End-Stage-Renal-Disease-ESRD-Center.html)
- End Stage Renal Disease National Coordinating Center. [http://esrdncc.org](http://esrdncc.org)
- The National Kidney Foundation. [https://www.kidney.org/professionals](https://www.kidney.org/professionals)
Large Dialysis Organizations
Dialysis Clinic, Inc. http://www.dciinc.org/

Small Dialysis Organizations (limited list)

This ASPR TRACIE Topic Collection was comprehensively reviewed in May 2015 by Joan Thomas, Director, Kidney Community Emergency Response, and Angelo Belfiore, Emergency Management Specialist, Kidney Community Emergency Response.

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