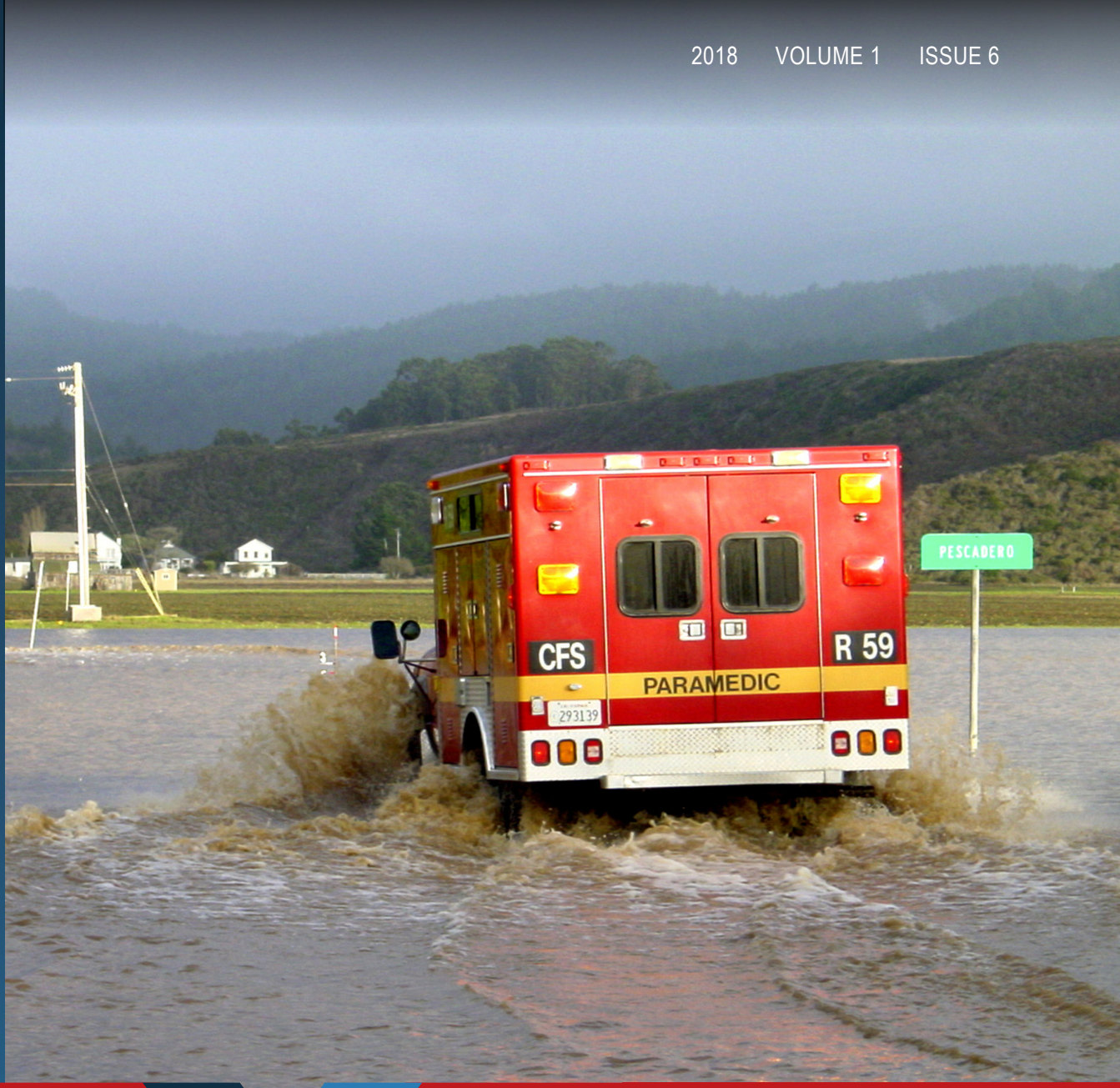
2018 VOLUME 1 ISSUE 6



the EXCHANGE

ASPR
ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Foreword

Keeping Communities Safe and Healthy in Times of Crisis

At ASPR, our mission includes supporting our communities' ability to withstand adversity, strengthening our health and response systems, and enhancing national health security. These past few months have challenged our mission and stressed our capabilities, as we've seen an extremely active and destructive hurricane season; lethal wildfires that destroyed miles of land; the deadliest mass shooting events in American history; and an early, severe flu season. Our nation's resilience has also been tested; yet in the face of multiple crises, we've seen local communities throughout the U.S. once again come together to support each other in the response and recovery process.

Healthcare professionals are part of these communities and are committed to "*primum non nocere*" (first, do no harm), placing patient well-being above all. So many of our readers have worked tirelessly through these and other local crises, treating disaster survivors and existing patients and often evacuating facilities to keep patients and staff safe from harm, sometimes while their own loved ones and property were in peril due to the same incident.

Evacuating healthcare facilities is a daunting task even when staff have advance notice. Patients have a myriad of needs and must be tracked accurately to ensure continuity of care. Some patient populations (e.g., dialysis patients, neonatal intensive care unit patients) require care and equipment so specific that evacuating them can pose special challenges to local, state, and federal programs and resources – as well as threaten their own health. Recent events demonstrated that while we may have solid written evacuation plans (and we may have exercised them annually), we still have a good deal to learn.

In this issue of *The Exchange*, we highlight the stories of healthcare coalitions, emergency managers, and local practitioners involved in healthcare facility evacuation due to two types of disasters: wildfires and hurricane-related flooding. We also share lessons learned by the private sector and federal staff who helped oversee the evacuation, movement, and care of dialysis patients in the hope that these lessons can help emergency planners identify gaps in their own evacuation plans.

ASPR understands the importance of having proven, operationally focused resources and templates at your fingertips. Through ASPR TRACIE, we are able to provide our stakeholders with these resources, often developed or reviewed by subject matter experts who have direct experiences with planning for and responding to disasters or public health emergencies. You can access specific ASPR TRACIE-developed resources or search the rest of our site from any page. Please do not hesitate to reach out to the ASPR TRACIE Assistance Center with additional best practices or lessons learned from facility evacuation so others may benefit from your advances. Or if you require technical assistance or have questions about this topic, please send your inquiry to askasprtracie@hhs.gov. As always, we welcome your feedback and we wish you a healthy, safe 2018.

Don Boyce, J.D., Director, Office of Emergency Management, Deputy Assistant Secretary, ASPR, U.S. Department of Health and Human Services

Welcome to Issue 6!

In the last months of 2017, several areas of the U.S. experienced unprecedented damage from historic wildfires and hurricanes. Many healthcare facilities had to make the very challenging decision to evacuate, and for the first time in U.S. history, care had to be arranged for a large number of dialysis patients. In this issue of ASPR TRACIE's newsletter *The Exchange*, authors from the private sector and federal, regional, and local levels share lessons learned from their recent evacuation experiences. We continue to release new Topic Collections and respond to a variety of requests for technical assistance. We've also created resource pages dedicated to specific topics: ASPR TRACIE-Developed Resources; Disaster Behavioral Health; Drug Shortages and Scarce Resources; Health Care Coalition Resources; Hurricanes; Infectious Diseases; and Mass Violence. Your feedback is what makes us successful—please contact us with comments, questions, technical assistance needs, and resources to share. We look forward to our continued collaboration.

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At a Glance

Photo courtesy of HHS ASPR.

What's New With ASPR?

A lot has happened since ASPR TRACIE published the most recent issue of *The Exchange*, which summarized TRACIE's past work and shared an outlook for the future. ASPR staff continue to manage the California wildfire and 2017 hurricane season response and recovery efforts. Acting Secretary Eric D. Hargan determined that a public health emergency exists in California in the wake of the wildfires and in the U.S. Virgin Islands (USVI) and Puerto Rico (PR) as a result of Hurricane Maria. Dr. Bob Kadlec (the Assistant Secretary for Preparedness and Response) visited the USVI and PR several times and shared his experiences in this blog post. ASPR's Division for At-Risk Individuals, Behavioral Health & Community Resilience (ABC), together with the Department of Veterans Affairs and the Department of Housing and Urban Development, released the toolkit Disaster Preparedness to Promote Community Resilience Information and Tools for Homeless Service Providers and Disaster. ABC also posted Filling the Gaps: Planning for the Disaster Health Needs of Patients Taking Opioids and People Using Illicit Drugs. This blog post shares how a Disaster Medical Assistance Team from Alabama carried out half a dozen missions in PR over a span of 20 days. In other news, HHS Biomedical Advanced Research and Development Authority (BARDA) added a new antibiotic to treat drug-resistant infections. Visit the ASPR homepage and blog to learn more about how ASPR is working to strengthen the nation's ability to prepare for, respond to, and recover from emergencies.

ASPR
ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE

The Last Stand: Evacuating a Hospital in the Middle of a Wildfire

Abstract: *"We're making a last stand." A firefighter spoke these words just prior to hospital leaders making the decision to evacuate the Kaiser Permanente hospital in Santa Rosa, California. Many Americans watched helplessly in the fall of 2017 as thousands of acres burned in western states. Some people had very little notice before they had to evacuate, often having to drive through flames with just the proverbial clothes on their backs. ASPR TRACIE interviewed Joshua Weil (MD), Assistant Physician-in-Chief, Hospital Operations of Kaiser Hospital Santa Rosa; Mitch Saruwatari (MPH), Director of Emergency Management, Kaiser Foundation Hospitals and Health Plan, Inc.; and Skip Skivington (MBA), Vice President of Healthcare Continuity Management, Kaiser Permanente, to learn more about their personal and professional experiences evacuating a hospital in the midst of a wildfire.*

Photo courtesy of National Interagency Fire Center

John Hick (JH): Please describe your current role, and how that played out during the evacuation.

Joshua Weil (JW): I am the Assistant Physician-in-Chief for Hospital Operations and a practicing Emergency Physician and I was working a night shift the night of the fire. As the event escalated, I assumed the role of Incident Commander.

Skip Skivington (SS): As a Vice President of Healthcare Continuity Management, I serve as the national incident manager for Kaiser Permanente (enterprise-wide). My office is physically located in our national headquarters building in Oakland, CA.

Mitch Saruwatari (MS): I am the Director of Emergency Management, and I report to Skip. One of my roles is to monitor any threat to our organization, capture information and develop situation reports in support of our command center and headquarters.

JH: Josh, please walk us through the event from your perspective.

JW: I was at home, trying to follow my usual pre-night shift routine, but I woke up from my nap early because our power went out. It was hot and stuffy in our house, but I didn't think too much of it. There was smoke around my house. I live a couple of miles from the hospital and when I got to work, I noticed it was smokier there than it had been at home. I recall hearing sirens in the distance. My shift started at 11:00 p.m. Once at work, a paramedic told me that every fire asset in the county had been deployed. This caught my attention, and while the night started off fairly routine, it became

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a bit busier than usual. We started receiving some patients with respiratory issues and general (not burn) injuries from being involved in fires at their homes.

At 1:00 a.m., I heard a call on the paramedic radio reporting a structure fire about four miles from my house, so I called my wife to wake her up and encourage her to get some things together in case she had to evacuate. When she walked outside, she noticed more smoke in the air around the house. She went back inside, grabbed the computer and our wedding album, woke up our daughter, and grabbed our dogs. She saw the fire glowing over a nearby hill; it was growing by the distance of a football field every three seconds. She went back inside to try to find the cat, but the house quickly became surrounded by fire.

In the meantime, my neighbor called me, not knowing I was at work, and frantically yelled at me to get out of my house. I left the patient I was working with and called my wife. My daughter answered, and she was just screaming—I could hear my wife trying to reassure her, but I could also hear transformers exploding in the background and I knew they were surrounded by fire. I told my family to come to the hospital. *Our house was consumed by fire*.

Things started picking up in the ER and we began to plan for a surge event, calling in additional staff, and trying to figure out how to move patients out of the emergency department into other areas of the hospital to create more capacity in the ER.

At about 1:30 in the morning, the Administrator on Call called me and asked what conditions were like as she was getting reports of significant smoke. I told her that I thought my house had just burned down. She suggested we open the Command Center, and I agreed. Shortly after the call ended, her house was consumed by fire.

Around the same time, Dr. Kirk Pappas, our Physician-In-Chief, also came in, having just lost his house to fire.

Things were moving very quickly at that point. By 2:00 a.m., we had opened the Command Center. I had another emergency physician come in to take over my patients while I transitioned to my role as Incident Commander. We began our situational assessment to determine who we had in the hospital (both patient- and provider-wise). We learned "through the grapevine" that Sutter Health System Center Hospital, located about a mile away, had been evacuated and that the fire had reached the north end of our campus, burning homes in the trailer park that abuts hospital property. At this point, there were county fire and law enforcement on scene in and around the hospital, and they were staging nearby, so we were able to communicate with their on-scene incident command.

It felt like everything was happening so quickly. If you asked me then, I'd say it only took us 30-35 minutes from when we opened up the Command Center to make the decision to evacuate. But it actually took closer to an hour and a half.

New patients were coming in, and we were doing typical triage on existing patients to determine who was mobile, who wasn't, and what their conditions were. Eventually, we lost power and switched to generators. Smoke abatement was becoming an issue; we were controlling the HVAC but it was becoming hot and stuffy in the hospital.

At 3:35 a.m., the fire Incident Commander came in and said something I'll never forget: "We're making a last stand." He explained that the firefighters were using the last couple rows of the trailers that hadn't yet burned and the dry creek bed to create a barrier and hold the fire off. That's when we made the decision to evacuate the hospital. We were already in communication with the regional command center and they supported that decision. We began strategizing transport to one of our sister facilities (Kaiser San Rafael).

At 3:40 a.m. we started getting patients to the evacuation point. Some were mobile and could walk there, and some were wheeled there, either in wheelchairs or on

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actual desk chairs equipped with wheels. Some were moved in their hospital beds.

One of our seasoned emergency nurses had just attended an emergency management conference and suggested we use privately-owned vehicles to evacuate patients with staff. Four city buses were provided to help with the evacuation, and patients who required higher-level care were transported by ambulance. Another staff member suggested putting someone by every patient (not necessarily clinical staff) while they waited in halls for evacuation to ensure they were monitored as necessary, so we did that, too. This was a great suggestion and worked very well. Within three hours, before 6:30 a.m., our last patient was out of the hospital and en route to the receiving facilities.

JH: Did you have any trouble getting an adequate number of ambulances?

JW: In the end, we did not have any problem. We got word that they would be sending us 20 ambulances, and between that and the buses and private vehicles, it was enough. We evacuated a total of 122 patients within three hours, including ED patients. There were a few women in the Labor and Delivery unit in the early stages of labor. They were evacuated by private vehicle with a manager from the maternal/child unit.

JH: How much training and practice had you done with regards to evacuation training, and how much of that is facility-driven versus system driven?

JW: We are required by the Joint Commission to do a disaster preparedness drill a few times a year, but in all honesty, almost all of our drills are surge scenarios. I remember drilling evacuation once in the past five years. I think we probably practiced with some of our tools such as a "Stair Chair" to evacuate one paper patient, but none of us had actual experience evacuating a hospital.

JH: How did the evacuation plan work/not work and what were some of the lessons learned?

JW: There was some improvisation, with the use of private vehicles and rolling desk chairs. We did start with traditional vertical and horizontal evacuation based on the direction of the fire, and we followed our plans and protocols as much as possible, including incident command and communications protocols, but a lot of improvisation occurred and lessons were learned.

For example, although we have a plan and process for patient tracking, the time compression made that impossible. To facilitate tracking, someone suggested using a smartphone to take pictures of patient arm bands. This is something we will add to our evacuation plan.

Concurrent to the North Bay fires, we had significant fires in Southern California, so we were monitoring from a higher systems level. Between September 25 and October 17, we had significant fires in Riverside and Orange County. While there was no direct impact to any of our facilities, there was lots of smoke and evacuations. Many members and staff were affected by these fires, too. The North Bay fires began on October 8 and 9, so we did have some overlap. Moving forward, we are updating our wildfire plans and incorporating lessons learned from the 2017 wildfires into our emergency operations plans. We'll also run exercises with peer groups. We will call for emergency preparedness professionals at our medical centers to update and review surge, evacuation, and wildfire response plans.

Mitch Saruwatari, Director, Emergency Management

JH: It is so hard to compare this emergency evacuation to more traditional emergencies. What other lessons did you learn?

JW: We actually carried out a "parallel evacuation." We are typically taught to have our mobile patients walk to the evacuation point first, and then you get the people who are in chairs to the

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Photo courtesy of Jana Baldwin.

evacuation point, and then you evacuate bed-bound patients, and last, you evacuate the ICU. Instead of following a series of steps, we evacuated them all at once. Our disaster preparedness physician explained later that one reason why this worked is because ICU nurses typically won't leave their patients to help others evacuate. We let them stay with their patients and I think that's one reason why we were able to accomplish this evacuation so quickly.

JH: Because the fire was encroaching on the facility, it really wasn't safe to stay there. Did you have a policy or process for facility abandonment?

JW: We didn't, but we had some quick discussions about it. We got all the patients out, but we also kept the incident command team and some security staff behind. We also kept an emergency physician and a nurse in the facility long term, so that if a patient walked in (as some did) they could get an initial assessment and be directed to other facilities.

These conversations were occurring and decisions were being made with the local and regional Command Center teams. And when I made the decision to evacuate, the first thought I had was "Man, am I going to get in trouble for this." But in retrospect, it was the right thing to do and we would have had to leave regardless. Smoke became an issue quickly and we then lost water pressure and medical gases. Once I saw some of the pictures that patients had taken of the fire from their rooms, I didn't regret the decision at all.

JH: Was there significant damage to the campus?

JW: Just minimal smoke damage. We remained an evacuation zone for several days afterwards as the fire continued and winds shifted. We had enough smoke and heat hit the facility that it was in the best interest of patient safety to remove every piece of supply from the hospital and then totally restock the hospital, which took eight days. This was a huge undertaking—we mitigated smoke damage, cleaned all terminals and cleaned all of the vents to mediate the impact of any smoke or soot on the HVAC system.

JH: Something like this is a regional effort—tell me about your area.

JW: The region encompasses northern California, from Fresno to Sacramento/Roseville, up North Bay to our area. It includes 21 hospitals and 4 million members. Having a hospital system this large

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was beneficial; they were key in coordinating patient movement to various other system facilities and maintaining patient records and other data (including the physical location of the data banks). Locally, we had internal assistance with delivery of care, where we could provide care, how we could best interface with/provide care for the community (how to provide and coordinate providers), and coordination with the resupply of the hospital.

JH: Was San Rafael able to handle the influx of patients?

JW: Yes, they run at half or less the capacity that we do. They are licensed for up to 110 patients, but typically have a census between 50 and 60. We are licensed for 173 beds, and that night our census was at about 90, plus the emergency department census. The week before the fire, however, we were at about 140. San Rafael was key in coordinating the evacuation, and the fact that we have this large system was another strength of the response.

JH: Was there much coordination with others besides emergency medical services (EMS)? Is there a local coalition, for example?

SS: We talked to the California Hospital Association extensively as well as each of the impacted counties' emergency operations center. We also exchanged situational awareness information on an ongoing basis with our colleagues at Sutter Health and the Veterans Administration. These working relationships have formed over time as a result of our state's emphasis on healthcare coalitions.

JH: From a systems and evacuation standpoint, what were some of the challenges you encountered?

JW: We all plan for surge, and we all have these big carts ready to roll out into the parking lot with plenty of equipment, but we don't have "go packs." We're not really ready to get patients on city buses with nurses and the necessary supplies for administering care. I definitely recommend looking into having go packs ready for this type of evacuation. As far as planning, another lesson we learned is that while it was very helpful to have nurses on the buses, and we had medical control via cell phone, it might have been even more helpful to have had physicians on buses, too. Another lesson we learned was related to electronic medical records (EMRs). Most hospitals have EMRs and most have the capacity to print out a 1-2 page disaster sheet. That night, however, we didn't have anyone in the hospital who knew how to print them out! We definitely need to have someone working on all shifts who knows how to operate that aspect of the EMR.

Another point that staff brought up was about communication that night—particularly that we weren't notifying them in a timely manner. Often even during "status quo," you typically don't know exactly who is in the hospital at 3:00 a.m. Do we have a list of staff (e.g., radiology, security, lab techs) who are on each shift? And how do you communicate with all of these members? We did a sweep at the end, which we would have done regardless, but it would be helpful to know who exactly who was in the building prior to having to evacuate. Right now, we use phone systems and overhead paging. We are considering sending situational updates via our communications system, but this is still being examined.

JH: What was done to maintain communications with staff and ensure they were cared for, considering many of their homes/ their loved ones were also being threatened by the fire?

JW: As far as staff was concerned, it was an unbelievable performance. I lost my home that night, but so did a lot of other people I work with. In fact, more than 200 staff from Kaiser Santa Rosa alone lost their homes to fire. Many of my colleagues didn't know the status of their homes—they just knew their neighborhoods were under threat. It would have bene really easy to imagine people leaving to care for their families and their homes, but none of them did. They all stood by their patients and their hospital. It's heroic. And

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I'm not just talking about doctors and nurses—every single person (radiology techs, environmental services staff, security) could have looked out the window and said "I'm gone," but they didn't.

The organization really stepped up. Human Resources was involved immediately and ran a parallel Command Center to ensure staff had access to the Employee Assistance Program and to coordinate those who had homes to offer with those who needed places to stay. They set up social media pages to facilitate communication. There was financial assistance. Because we knew that San Rafael was handling a larger patient volume than they were used to, Kaiser sent physicians, nurses, and patient care coordinator teams to help manage Santa Rosa patients at the San Rafael hospital.

SS: We also reached out to FEMA who were excellent government partners. FEMA established a "mini assistance center" right on our campus since we had so many people devastated by the fires. In addition to FEMA's help we created internal helplines for our people which included providing temporary housing mostly through hotels throughout the entire San Francisco Bay Area. The fires destroyed a large portion of the available housing stock in and around Santa Rosa, and we have learned the going monthly rental for 2,000 square feet of living space, assuming it's even available, is $10,000.

JH: How do you get notified at the regional/system-wide level?

SS: We have an enterprise policy that requires my group to notify me whenever one of our hospital command centers is activated. We then, among other things, ensure those impacted are getting all of the assistance they need to be successful. All disasters are local, but a nice feature of being a part of a larger system is that our local medical centers can count on regional support as well as national support. We lean in, along with our regional and local internal incident management teams, to provide direct support to deal with the situation. Just as importantly we "connect the dots" across the organization, which invariably becomes necessary during large and complicated responses like this one. Our mission is to lighten the load - as much as possible - for those on the front lines of the disaster.

JH: What support comes from the headquarters level?

SS: Essentially anything that is needed for medical centers and regions to be successful. Fortunately, our local leadership, working closely with their regional leadership, have at their disposal everything they need to be successful; however, certain large disasters may require new or revised national policies shaped to handle the unusual situations created by the disaster. For these wildfires, no specific requests were elevated to the national headquarters.

The main reason why no requests were elevated to the national headquarters was our Northern California Regional Command Center worked around the clock in shifts mimicking exactly what was being managed locally (e.g., logistics, pharmacy, human resources, government relations, public affairs, security, continuum of care, safety, etc.). Given the emergency housing needs, our Human Resources Department activated their command center to address the needs of our people with counselling support, emergency housing, and emergency financial grants to name but a few of the areas they worked on diligently to address as quickly as possible. Watching the various command center functions work in parallel and seamlessly is much like experiencing a professional symphony orchestra perform.

JH: How were you able to move such a large amount of supplies out and back?

SS: Think "Berlin Airlift;" it was just that pronounced! First, all of the supplies needed to be removed from the hospital and subsequently destroyed or donated to one of our partner medical supply repurposing organizations. Then every inch of the hospital had to be terminally

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cleaned to get ready for reopening. As all of that was occurring, caravans of 40 foot trailers were arriving on a continuous basis with fresh medical supplies that were offloaded and staged for restocking in the clinical areas that were determined to be clean and ready for reopening.

JH: How did you keep track of all the supplies coming out and in? How was this coordinated?

JW: In retrospect, we wish we had done a better job tracking supplies. We started with our list of what we should have had (e.g., matching crash cart lists) and reconstituted our hospital.

SS: This was handled locally with a lot of help from the regional and national supply chain teams not to mention volunteers from other medical centers within our Northern California Region who pitched in and assisted with this huge task.

JH: Any closing thoughts?

SS: With everything that Josh described, one of the key points I would like to stress is that there were NO untoward patient events as a result of the total evacuation. That is truly amazing!

Editor's Notes:

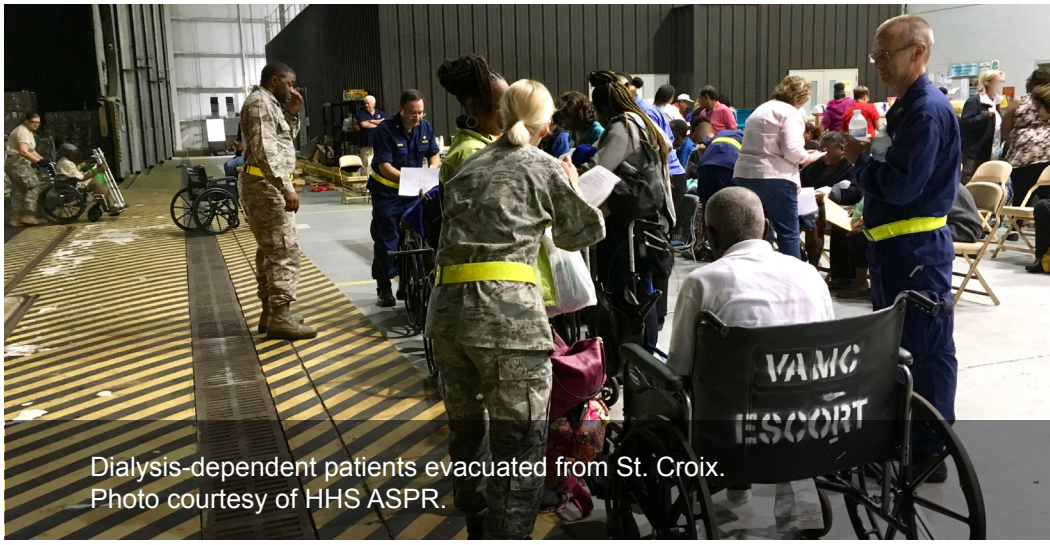
A true emergency evacuation of a healthcare facility is a daunting prospect. Making sure basic medications, patient care supplies, and key belongings are easy to organize and transport is important. Evacuation equipment education and training are important, but so is the education of command and unit staff about when and how to evacuate versus shelter in place. Facility-specific templates can often be used to predict EMS needs, saving precious resources that would be dedicated to conducting a real-time assessment. EMRs often contribute to challenges during evacuation events; printing "face sheets" for patients at the first sign of danger (e.g., a tornado warning, communication with first responders) can help the evacuation (and patient tracking and relocation) run more smoothly. Using all transportation options available is key, as EMS resources may be committed to responding to the community. Medical personnel must be prepared to accompany patients in non-traditional vehicles. Finally, patients will often continue to present to "closed" facilities and families will call seeking information when they hear about the evacuation – make sure your plans address continuity of services as well as a process for reopening a closed campus. ■

Related ASPR TRACIE Products:

- Healthcare Facility Evacuation/ Sheltering Topic Collection
- Hospital Surge Capacity and Immediate Bed Availability Topic Collection
- Natural Disasters Topic Collection
- Recovery Planning Topic Collection
- Tips for Retaining and Caring for Staff after a Disaster
- Disaster Behavioral Health: Resources at Your Fingertips

Evacuating, Treating, and Tracking People on Dialysis: Lessons Learned from the 2017 Hurricane Season

Abstract: *The 2017 hurricane season devastated many areas of the nation, several repeatedly. After Hurricane Irma struck the U.S. Virgin Islands (USVI), many patients were evacuated to Puerto Rico (PR) to ensure continuity of care. Once Hurricane Maria ravaged PR, however, many USVI residents were evacuated a second time, including renal dialysis patients. ASPR TRACIE's Senior Editor John Hick (MD) interviewed Andy Stevermer, Incident Response Coordination Team (IRCT) Program Manager for ASPR's Office of Emergency Management (OEM) Division of Operations (who served as the Operations Section Chief during the response), Commander Selena Ready, a Risk Management Analyst at the U.S. Food and Drug Administration (USFDA) (who served as the IRCT Patient Movement Operations Branch Chief during the response), and Victor Harper (MS, Director of Logistics, ASPR OEM) to learn about lessons learned from this evacuation from a federal patient movement perspective.*



Dialysis-dependent patients evacuated from St. Croix. Photo courtesy of HHS ASPR.

John Hick (JH): Tell us about your role at the time of the incident and how the services you provided integrated with the overall federal response.

Andy Stevermer (AS): I served as the Operations Section Chief of the Emergency Management Group (EMG) at the operations desk for all three hurricanes. My daily job is to run the IRCT, so I was also busy staffing a variety of incident management needs across the various Areas of Responsibility as the situation developed.

Selena Ready (SR): During this response, I served as the IRCT Patient Movement Branch Operations Chief. Typically, during deployments, I serve as the U.S. Public Health Service Services Access Team (SAT) 3 Commander. SATs have a variety of deployment capabilities, but were originally formed to provide resources and assistance to local health authorities with discharge planning for patients and their caregivers in mass sheltering—particularly in special needs shelters (e.g., Federal Medical Station [FMS]). When deployed in support of federal patient movement, SATs typically track the patients and caregivers from the area of impact to the National Disaster Medical System (NDMS) hospital and coordinate their return home (once the patient is medically cleared and the impacted area is safe and has appropriate resources). So, this was a new role for me. Part of my job as IRCT Patient Movement Operations Branch Chief was to oversee operations of the SATs.

JH: Do SATs typically serve dialysis patients?

SR: SATs are involved in the federal patient movement response so, yes, this could include dialysis patients. However, this was a very atypical response in terms of the

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The Kidney Community Emergency Response (KCER) Program, under contract with the Centers for Medicare & Medicaid Services, provides technical assistance to End Stage Renal Disease (ESRD) Networks, kidney organizations, and other groups to ensure timely and efficient disaster preparedness, response, and recovery for the kidney community. The KCER Program's disaster preparedness resources help save lives, improve outcomes, empower patients and families, educate healthcare workers, build partnerships with stakeholders, promote readiness in the community, and support the ESRD Networks.

volume and movement of dialysis patients. This was all new territory for us—*we've never moved dialysis patients out of an area of impact before*.

AS: After Hurricane Ike hit Texas in 2008, there was a plan to move dialysis patients from Galveston Island to an FMS in the Austin area, but it wasn't carried out because they were able to identify additional dialysis capabilities in the Houston area and closer to home. But that was the first time I can recall Emergency Support Function-8 (ESF-8) considering the movement of a specific sub-population out of an impact area.

JH: How did you come to the decision to evacuate dialysis patients? What were your options and what was the calculus in deciding that the movement had to occur

SR: Most of the dialysis centers in the USVI were rendered non-functional by the storms. Atlanta (located in Region IV) was determined to be the primary reception area for dialysis patients. Ninety-seven percent of the patient population came from the USVI, mainly from St. Croix, and the remaining 3% came from PR.

AS: We did not relocate dialysis patients from PR on a massive scale to the continental United States (CONUS). There are about 6,000 dialysis clients on PR, and their system was brought back up fast enough to provide the care needed. After Irma made landfall in the USVI, we did evacuate some dialysis patients from St. Thomas to PR (which made sense because of proximity). However, after Maria hit PR, we started bringing these clients into Region IV.

SR: As of December 11, 2017, we had moved a total of 174 dialysis patients into Atlanta.

JH: How were patients identified and transported?

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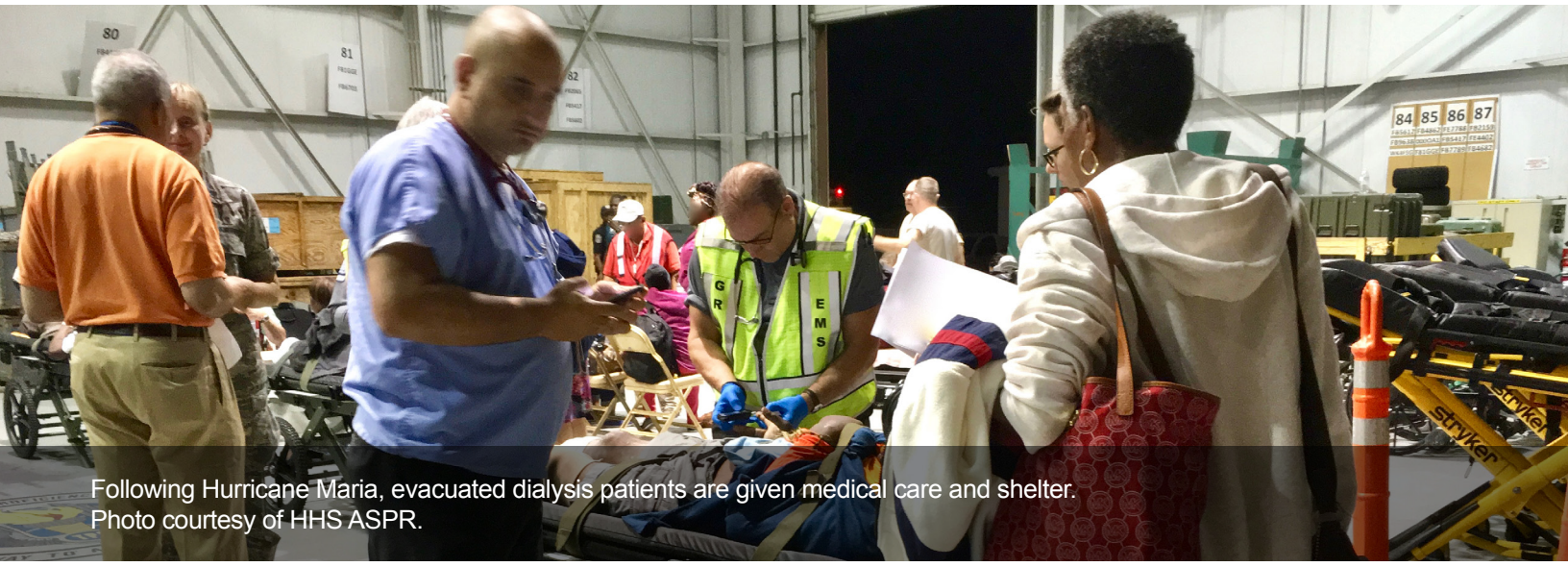

Following Hurricane Maria, evacuated dialysis patients are given medical care and shelter.
Photo courtesy of HHS ASPR.

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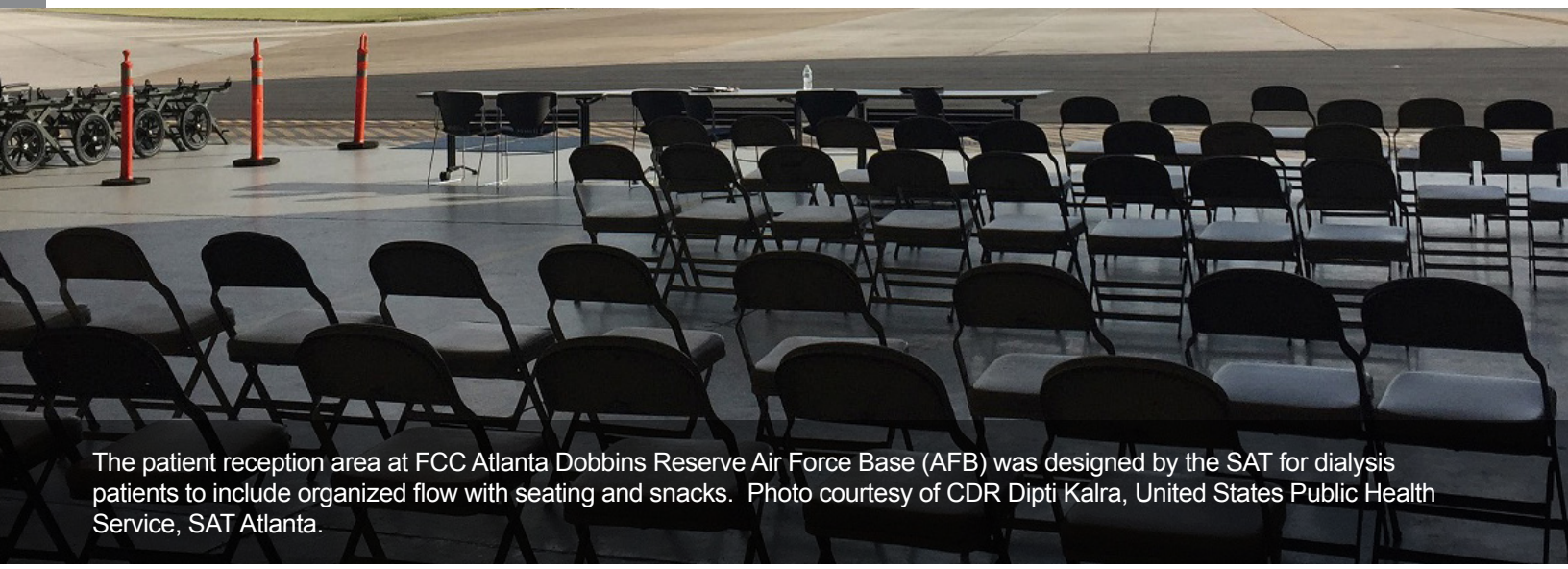

The patient reception area at FCC Atlanta Dobbins Reserve Air Force Base (AFB) was designed by the SAT for dialysis patients to include organized flow with seating and snacks. Photo courtesy of CDR Dipti Kalra, United States Public Health Service, SAT Atlanta.

AS: They used emPOWER data to help identify individuals on dialysis treatment in the impacted areas. The NDMS handled the patient movement side; most were moved in aircraft provided by the Department of Defense.

JH: How did you handle logistics in the Atlanta area?

SR: We used a Federal Coordinating Center (FCC), which is a designated entity in each region—often a Department of Veterans Affairs medical center or Department of Defense medical treatment facility—that coordinates NDMS patient reception. In a typical NDMS patient movement scenario, seriously injured or ill patients are loaded on a plane, the plane lands at the FCC, and a medical team on the ground assesses and triages patients, then puts them on ambulances which take them to various hospitals. For this group of dialysis patients, we had to modify the intake process. They came off the plane and were processed through a "med check" by a team of physicians and nurses, given snacks and beverages, and the SAT gathered patient tracking data and oriented them to their location. Then, they received a gift card from the American Red Cross, registered with the Federal Emergency Management Agency's (FEMA) Office of Disability Integration and Coordination, and we transported them based on their triage results. If they were deemed "hotel appropriate," we grouped and transported them to a hotel. If not, they were transferred to a hospital like a typical NDMS patient. Once they were placed in hotels or hospitals, the SAT coordinated their care and discharge plans.

JH: How did you facilitate the dialysis care? Were patients worked into existing openings at various local facilities?

SR: We have a contract in place with the End Stage Renal Disease Network (ESRD) who identified and connected patients with nearby dialysis centers. We coordinated housing, dialysis-appropriate nutrition, transportation to/from the dialysis centers, and other medical and primary care services for the patients.

JH: How are we helping patients get back home?

SR: We have to ensure that the infrastructure is in place back home to support their dialysis before they can be returned. We continue to monitor this through the Kidney Community Emergency Response Program (KCER) to determine what dialysis centers are available. The SAT also connects patients with FEMA and their Individual Assistance Program and patients need to confirm their homes are habitable.

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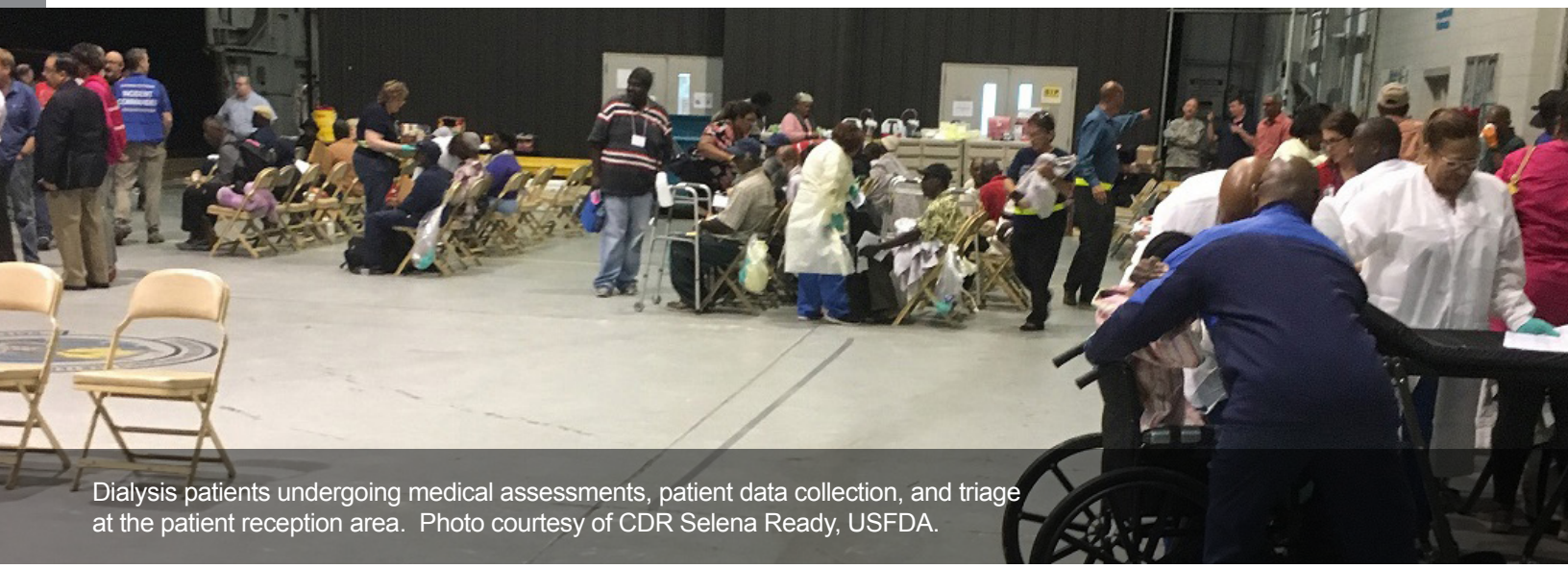

Dialysis patients undergoing medical assessments, patient data collection, and triage at the patient reception area. Photo courtesy of CDR Selena Ready, USFDA.

JH: Are there any contracts or existing resources for rapidly deploying or setting up dialysis centers?

AS: No. We have looked into building soft- or hard-sided dialysis facilities and some private facilities are trying to free up chairs, but in terms of mobile centers, we don't currently have those capabilities. We have explored multiple avenues for this purpose, especially in the interest of getting centers back on line so that patients can return home. The federal government has even looked into placing mobile units on floating vessels, but while creative, these are also very expensive propositions. Selena and her team have been working on intermediate placements. For example, some patients have family in other parts of the country they could stay with as an interim step before going home. As soon as we can guarantee that there is a safe home and a dialysis center available, we will help patients get back home to the USVI.

JH: Were there any other patient subpopulations that were equally affected?

AS: Not specifically, but there were a lot of medical evacuations due to other health conditions. Those worked out better because they were true hospital-to-hospital referrals, and the FCCs and the NDMS patient movement system worked better because it was designed for this.

Here, we had people at home who ended up at the Aerial Point of Embarkation and then get to the FCC (because of the system) and Selena and her team had to figure out social services in addition to medical care. The NDMS was not designed to move individuals from their home to a shelter location so that they can continue to receive outpatient services like renal dialysis.

JH: Were there any checklists or tools you used or would like to have at the airhead or on-site screening area that could be templated?

SR: For moving patient subpopulations, we definitely need a templated intake form, and we also need it to be comprehensive. The forms we originally had at the FCC were specific to patient tracking —they didn't list or track any human services needs. We also had some issues with patients not having identification and we did not have a JPATS team in place at the location where we were loading patients on the plane. We typically do, which prevents the need to collect the data when patients are getting off of the plane.

JH: Any particular lessons learned that could improve the response next time?

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SR: Our greatest challenges were related to the Joint Patient Assessment & Tracking System (JPATS) (the electronic records system used by NDMS). We faced two specific challenges: 1) assessing and tracking an atypical (ambulatory, in this case) population and 2) aggregating the data. Due to the large number of patients, having a database where we could input patient-specific human services needs would have been helpful because we had to communicate the need numerically (e.g., the number of coats or meals per patient per day) and coordinate/provide the services.

Another challenge we faced is a common one: responder turnover. I would love to see responders be able to stay longer and not have to switch out every couple of weeks.

AS: I have two lessons learned. The challenge Selena touched on with longer duration responders is a symptom of the federal response in general. We cannot do business in Type 1 (major disaster requiring federal resources) responses with 14-day deployments. We need to look at longer-term deployment. In addition, we do not have a sufficient number of SAT teams to deal with consecutive Type 1 disasters like this with multiple displaced people. SAT has a unique skill set of case management and medical case management skills and we don't have deep bench strength. We just don't have enough of them.

The second issue is we don't have a soup-to-nuts system of providing wraparound services to displaced populations. During the Katrina response, FEMA set up an air bridge that moved thousands of people across the country. All of a sudden, we had a situation of a couple of hundred internally displaced individuals who weren't necessarily medical shelter type clients, but had specific needs (i.e., dialysis), and we didn't have a plan for this specific displaced population. Usually this would be handled through ESF-6 and mass care, but throw in the fact that these patients have a dialysis medical need, and HHS has the responsibility for the wraparound services—the feeding, sheltering, clothing, and transportation. We just don't have a plan for that because we've never medically evacuated a group of individuals with a set of unique needs.

Initially, USVI dialysis patients were placed in an FMS-type asset at the Florida International University (FIU), but it was quickly realized that this was not sustainable. They switched to the "hotel model," then learned that some clients needed a higher level of care. Some clients' medical conditions deteriorated as time passed necessitating a higher level of medical care.

SR: Yes, a lot of decompensation took place with patients, especially the elderly. Many of them were stable in their own communities and moving them created unanticipated challenges. Also, we learned quickly that in a hotel Americans with Disabilities Act (ADA) rooms are not the same as wheelchair-accessible rooms. And in many cases the patient manifests from the flights weren't detailed enough to capture the actual need of wheelchair-accessible and ADA room needs prior to their arrival at the FCC. Trying to triage them into hotels all over the Atlanta area was definitely a challenge.

Another lesson we learned was specific to caregivers. While we had 174 dialysis patients to care for, many of them came to Atlanta with "non-medical attendants," many of whom had forgotten their own medications and were also fragile and/or elderly—this added to the challenge.

As for the SAT's unique skill sets, Disaster Case Management Teams are typically comprised of one social worker and under them, a team of people who are

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Related ASPR TRACIE Products:

- Dialysis Centers Topic Collection
- Healthcare Facility Evacuation/ Sheltering Topic Collection
- Utility Failures Topic Collection
- Major Hurricanes: Potential Public Health and Medical Implications
- Health and Social Services Recovery Lessons Learned from the 2016 Louisiana Flooding (webinar)
- Hurricane Resources at Your Fingertips
- After the Flood: Mold-Specific Resources

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good at coordinating care and communicating. We try to build our SATs in this same model, with one social worker paired with four healthcare workers (who may not be social workers). Social workers are responsible for discharge planning (to include connecting patients with family members in the state if applicable). In this case, however, we ran out of social workers. We need to incorporate this lesson into future plans for sure.

AS: We need to look carefully at other isolated CONUS and outside the continental U.S. locations (e.g., in the Pacific Ocean or Alaska). Disasters similar in scope can definitely happen again and we need to be prepared to deal with this patient population when there is no electricity or water to run dialysis centers.

Federal Patient Movement

There are three levels of patient movement:

- Local: After a disaster, local Emergency Medical Services (EMS) (e.g., ambulance, police, and fire) handle the bulk of patient movement.
- State: Once local authorities become overwhelmed, they will request assistance from the state. If possible, state authorities will assist, but local authorities will continue to carry out the majority of the response efforts. The state may also reach out to neighboring states through the Emergency Management Assistance Compact (EMAC) for additional support.
- Federal: Once state resources, including all EMAC agreements, are (or could potentially be) overwhelmed or exhausted, the state requests federal-level resources.

When a state requests federal support to move patients, the U.S. Department of Health and Human Services (HHS), as the lead federal agency for Emergency Support Function-8, Public Health and Medical Services, will implement the patient movement system, which is comprised of five functions: patient evacuation (to include patient reception and management), medical regulating, en-route medical care, patient tracking, and re-entry.

Editor's Notes:

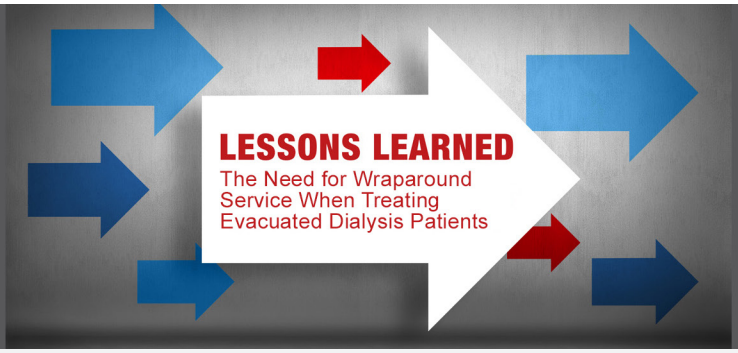
Providing dialysis services is an intricate process and can be particularly difficult after a major disaster. Power, reliable transportation, and highly pure water (hundreds of liters per patient) are just a few of the challenges that can interfere. Fortunately, KCER works closely with Fresenius, Davita, and other providers throughout the country to provide strong programs and relationships and can usually maintain continuity of treatment.

One of the main lessons learned from the 2017 hurricane season was the complexity of the social services issues that needed to be addressed, which were not able to be met through usual shelter channels. State and local emergency planners should work to ensure that they are coordinating with their local and regional representatives when considering the needs of the dialysis-dependent population. When infrastructure is damaged across a wide area, access to treatment may be difficult and require patient relocation in order to assure their safety. Identifying patients and assisting them with personal plans prior to an event, encouraging pre-disaster dialysis when possible, and communicating with patients as soon as possible after disaster are the first steps. Federal patient movement intake forms did not fully capture the data necessary, adding precious time to an already strained process. Updating intake forms and other data collection tools can help provide more personalized treatment as soon as practical.

Most dialysis patients have complex medical and social needs that cannot be addressed by providing dialysis services alone. Not addressed here is the strategy of "pre-dialysis" – dialyzing patients prior to landfall of a hurricane, for example, that can buy valuable time while decisions about evacuation versus bringing in services are made. Healthcare coalitions should be sure to partner with their local and regional dialysis providers when working on their plans and exercises. ■

Access these ASPR TRACIE resources for more information:

- *Federal Patient Movement: NDMS Definitive Care Program Fact Sheet*
- *Federal Patient Movement: Overview Fact Sheet*
- *Federal Patient Movement Service Access Team Fact Sheet*
- *Joint Patient Assessment and Tracking System Overview Fact Sheet*
- *Patient Movement and Tracking Topic Collection*



Victor Harper, MSM,
Director of Logistics,
ASPR OEM

The Need for Wraparound Services When Treating Evacuated Dialysis Patients

In Atlanta, our support was unique and different from past responses. Our core mission is to provide HHS responders with the supplies, logistics, and equipment they need to perform their mission during a disaster response. As patient movement operations unfolded for the back-to-back hurricane responses and disaster survivors were being relocated to the Atlanta area as National Disaster Medical System (NDMS) patients, we realized there was a gap in providing basic life services support such as meals, shelter, and transportation. We quickly developed requirements and implemented the necessary support contracts to ensure the proper delivery of wraparound services were available to our disaster survivors. Some of these services included:

- **Culturally Appropriate, Renal Meals.** We developed and coordinated contracts requirements through FEMA and services were provided by American Red Cross, who continue to provide culturally appropriate and renal meals.
- **Emergency Housing.** We also developed contracts through FEMA with six different hotels. Because Atlanta is a very busy area in the late summer for national conferences and events, securing lodging was very challenging at first. Eventually, we were able to relocate all disaster survivors to extended-stay hotel rooms that offered them more independence.
- **Transportation to and From Dialysis Appointments.** Initially, transportation was provided using a FEMA Emergency Medical Services contract, but eventually this service became out of scope of the contract because it was no longer an emergency patient movement service but developed into a routine service. We developed requirements and established a paratransit transportation contract through FEMA which provided patients transportation to and from medical appointments and stores where they could purchase personal items.
- **Personal Assistant Services.** These contracts provided disaster survivors assistance with daily home functions in a government lodging environment (e.g., bathing, cooking support).
- **Nurse Case Management.** Later, as we saw some patients were not able to return to independent lodging, we added nursing case management as a component to the personal assistant services contract. This expanded the capability of disaster survivors to get post-evaluation following dialysis treatment to determine if they required a higher level of care.

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As we continued to assess disaster survivor requirements, we also added a basic medical care component to our strongbox of wraparound services and expanded medical surveillance activities of this population.

One lesson we learned from this response was that it wasn't just the dialysis patients who needed wraparound care; services needed to be provided to their non-medical attendants who evacuated with the patient. This posed a unique challenge for Logistics as we had never performed this type of mission before. As requirements emerged and changed, we found ourselves writing contracts in real time to keep up with wraparound service requirements, patient care, and service demands.

In the future, as we conduct NDMS patient movement from any affected area, we will definitely consider having pre-developed wraparound services contracts. This circumstance could occur in other more remote locations such as American Samoa, Hawaii, or Guam.

From the Continental United States (CONUS) perspective, as far as we know, most medical facilities have agreements with states that can provide support after a disaster.

When we first approached this mission, it seemed like a typical request. What was unique about this situation was the supply and wraparound service needs associated with providing dialysis treatment. Any type of population (e.g., cancer patients) that have a requirement for outpatient services could be affected and have similar requirements. Traditionally, we are accustomed to supporting in-patient disaster survivors. Dialysis patients are not considered in-patients, thus the real-time, day-to-day challenges arose.

In the future, the evacuation of dialysis patients and their specific needs should be incorporated as part of the planning scenario with ESF-8 as a whole, to include private, state, local, and federal partners. Going into this event, we did not fully know what capabilities and organizations were already in place and/or could have been mobilized to provide support. Also, looking at patient movement from a federal perspective, this scenario should be included in our planning efforts. When a population comes from a location Outside of the Continental U.S. (OCONUS), we have to coordinate better between ESF-6 or ESF-8 on delivering full wraparound services. Whether it's an interagency agreement, or an agreement between the government and the private sector, these services need to be in place so they aren't being created while evacuating. We also learned that federal responders need better transparency on when hospitals supporting NDMS patients discharge and move our patients from location to location. In some cases, with little or no notification before discharging a patient, it could become challenging to provide federal support to ensure their transition to a stable living environment is met. ■

How the Private Sector Helps Dialysis Patients and Clinics Prepare for and Respond to Disasters

Photo by Andrea Booher.

Abstract: *In addition to experiencing a devastating hurricane season with repeat "hits" from Hurricanes Irma and Maria, healthcare facilities in the U.S. Virgin Islands (USVI) and Puerto Rico (PR) participated in an unprecedented evacuation of dialysis patients (primarily to Atlanta, GA). ASPR TRACIE interviewed Bill Numbers (Senior Vice President, Business Continuity, Fresenius Medical Care) to discuss private sector-federal government coordination and collaboration and lessons learned from the event.*

John Hick (JH): Bill, please tell us more about your position and the role you played after the storms.

Bill Numbers (BN): I serve as the Senior Vice President of Business Continuity and the Incident Commander for all disaster programs in North America. Fresenius Medical Care has more than 2,200 dialysis facilities, including outpatient cardiac and vascular access centers, and urgent care centers, as well as the country's largest practice of hospitalist and post-acute providers. The core of our disaster program is focused around getting every affected dialysis facility operational and communicating status with clients as quickly as possible after an event.

We have one distribution company that provides supplies (e.g., personal generators) to 80% of patients in the U.S. This chain allows me to maintain assets in warehouses all around the country and I can have them moved at any point in time to support disaster-affected areas in the continental U.S. (CONUS). When storms struck the USVI and PR, however, we didn't have the same local capabilities or easy access to equipment.

JH: What are some of the disaster preparedness services you offer dialysis patients in CONUS?

BN: We have several communications channels, and offer 24/7 coverage. Prior to an event, as long as we have warning, we provide patients with the telephone numbers for local and national emergency lines. Close to 1,000 case managers also call clients daily (e.g., to welcome new clients, to assist dialysis patients who will be traveling) and can add emergency communications to these calls. We also maintain other call centers and we have joint ventures with physicians' hospitals and other medical groupings. We can use any of these lines to find and communicate with patients in an emergency situation.

Every facility is in touch with their emergency operations

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Considerations to Address Before Dialysis Patients Can Return Home

Provided by
Bill Numbers, Fresenius Medical Care

- Assuming that shelter is not being set up, patient home needs to be habitable to ensure patient is free of infection.
- Is the home standing? Is damage to the home substantial?
- Is the home habitable?
- Can the home be secured and locked?
- Does the home have air conditioning?
- Does the home have a reliable source of hot water for personal hygiene and hand hygiene?
- Can the patient maintain a clean environment in the home?
- Is there any evidence of mold growing?
- Is local water being tested to ensure it is potable?
- Are there reliable electric services? (Patients should not have to rely on personal generators.)
- Can transportation reliably reach the patient three times a week and transport them to the dialysis clinic?
- Will the patient have access to 911 services?
- Will the patient have access to hospital services for emergency care?
- Will the patient have access to emergency de-clotting services?

center (EOC). Communication is not always perfect, but there is familiarity and we stay in touch during every disaster and respond to facilities that need power, water, and other supplies.

We also work closely with the Kidney Community Emergency Response (KCER) Program (our lifeline with the federal government). They are very much involved year-round from a disaster response perspective. We provide them with center data (e.g., open-close status, supply needs) and they are extremely responsive. Through this partnership, we can assist other dialysis companies who may need resources like generators, water, or other supplies. We share information and supplies frequently—it's a very communal field. While I almost always have the necessary assets, coordination can be tricky and we need to communicate with an agency like the Federal Emergency Management Agency (FEMA) to ensure supplies are making it where they are needed.

JH: How does your agency help clients with individual disaster preparedness?

BN: It is now a condition of coverage in the dialysis community to have—and we worked with KCER to develop—a disaster preparedness program. Through this program, every patient is given disaster preparedness training where they learn about dietary supplies to stock, medications to keep at home that can assist them if toxins build up due to missed treatments, having enough general supplies at home for three days, how to reach us via telephone, and what to put in go bags. We provide refrigerator magnets and a list of nearby centers they can go to for treatment if their usual one is closed due to disaster. Reminding patients that they've received this training is just as important as providing it!

Fresenius patients' medical records are virtual and accessible from any location. We also have processes and procedures in place to treat patients who just walk in the door after a disaster; our initial intake system ensures quick treatment for new patients.

On the staff side, every clinic goes through an annual all hazards assessment, and it is focused on local and general hazards. The CMS Emergency Preparedness Rule mandates that dialysis facilities must also participate in a community disaster exercise. Every dialysis facility also participates in internal tabletops; they are also required to work with local healthcare providers and EOCs on at least one community drill. The only time they don't have to do this is if they've gone through an actual disaster.

Every part of our company is involved in the disaster program (from contracted suppliers to healthcare practitioners). We

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build 200 new dialysis clinics a year, and most clinics must have large emergency generators on site. We actually require that those generators be available (in their construction yard) a year in advance so that at any moment in time, we can move a giant, clinic-sized generator to a disaster site. Our distribution centers also maintain a lot of disaster supplies and equipment. For example, we have 1500 personal generators that we can provide to staff in affected areas to use at home. This can help staff ensure that their loved ones are taken care of and encourages staff to stay in the area if they can and report to work.

JH: How does the logistics of being on an island change what you are able to provide and coordinate?

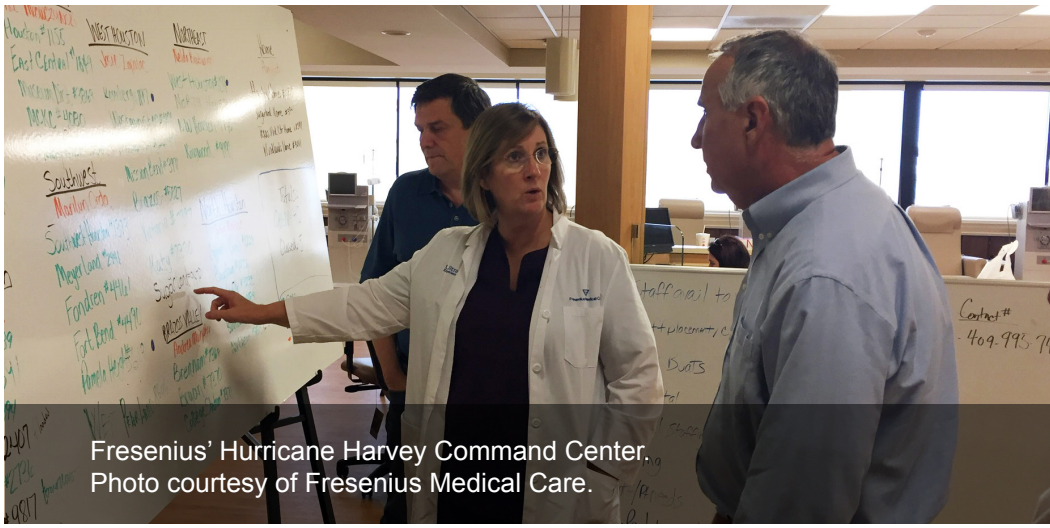
BN: During Hurricanes Katrina and Sandy, there were evacuations ahead of time and those patients went far and wide—sometimes several states away. People either self-evacuated or were assisted by the government. In Puerto Rico, because the entire island was affected, residents couldn't just quickly hop on a bus and go somewhere—and this was the first time we've faced something like this in the 20 years I've been in the field. I was very much in favor of evacuating as many people as possible off of PR right after the storm. Most dialysis patients are compromised in one way or another (some with comorbid conditions). These people just shouldn't be living in conditions where there is no water, power, food, etcetera.

In a state, if the governor says evacuate, we (our providers) all evacuate, mainly to encourage our patients to evacuate. If providers stay, patients will be more likely to stay and we don't want that. This is one of our after-action review findings; we'll be working with the government of PR to adopt this mindset.

After a disaster, one facility can handle up to three other clinic populations. If a clinic has 50 patients, they could take on another 150 patients in an emergency. In non-emergency times, a patient gets four hours of treatment three times a week, but we'll drop that to two hours twice a week and we'll run 24/7. Evacuating can relieve some of this pressure, but recent disasters made this nearly impossible. In PR, we had to keep this situation going for weeks on end, which was unprecedented, and this compromised patient health.

Around CONUS, I can move assets very quickly—we have groups of people who will go in and set up a command center. In Texas, we set up six command centers after Hurricane Harvey. In PR, however, we could only set up one in San Juan because accessing other areas was so challenging. We also couldn't bring in supplies very quickly; we had to use six private cargo planes to bring in supplies. We supply dialysis supplies to all patients (approximately 6,000) on the island. This was extremely expensive, and something we don't normally have to do when working in CONUS.

In large disaster situations, we also contract with and send in guards who protect staff and



Fresenius' Hurricane Harvey Command Center. Photo courtesy of Fresenius Medical Care.

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Fresenius disaster response vehicle.
Photo courtesy of Fresenius Medical Care

assets. We had to charter about a dozen private planes to do this in PR. Because there were so many areas of the country hit by disasters at the same time, locating security staff was also very challenging. The next group that came in on planes were equipment repair and clinic assessment staff.

JH: Were there any challenges associated with patients from the USVI who stayed versus evacuating?

BN: We were contacted by KCER to see if we could provide assistance to St. Thomas and St. Croix. My first comments were that I didn't want to send equipment in—I did not want patients to stay there without water or power. I handle Fresenius Medical Care's disaster program around the world and have witnessed situations similar to those that occurred in the USVI. For many patients who didn't evacuate, infections set in and there was no other medical care available to them. The next few weeks become very bad. I said no, we would not to send anything in, but we would spend every resource we could to get them out, knowing how difficult that would be. The flight was the easy part, but coordinating services after that was the challenge. In the future, we might consider working closer or better with on-ground emergency centers to provide dialysis services.

The same thing happened on Tortola (in the British Virgin Islands). We don't normally operate there either. In this case, we offered to take patients to other clinics. The British government decided not to fly staff or patients off the island, based on a vote they said they held with the patients. We have carried out similar votes in the past and we find that while people generally don't want to evacuate, patients don't know what they don't know in these situations, and it often ends up terribly. In this situation, we sent some staff and equipment in, but every staff member that reported to Tortola said it wasn't safe and expressed the need to get patients out of there. As employees returned after a couple of weeks, they shared heroic stories of working in austere conditions to treat patients, but the bottom line was that it wasn't a good situation and there were a lot of problems. Several patients became infected and had to be evacuated; some did not return because they became so ill. They essentially had to create a shelter at the dialysis center—the roof was half off, electrical power and water supply were spotty, and we ended up having to feed patients. This was very similar to what happened after Hurricane Katrina in Gulfport (MS)—we wanted to evacuate that dialysis center, but staff voted not to, and it ended up turning into a shelter with pets, family members, everyone who saw a light on, and we had to provide other services in addition to dialysis (e.g., food, shelter, other medical needs). To this day on Tortola, the situation is still bad, and no staff should go in there and assist until each patient's living conditions are assessed. I really believe the U.S. government did the right thing evacuating the USVI.

JH: How can portable dialysis units be used after a disaster?

BN: I want to be sure that your readers understand the definition of portable/mobile dialysis: this is something we do in over 1,000 hospitals in the U.S. today. Sometimes this is done in the patient's room, sometimes in the ICU, and sometimes in

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intermediate care environments. We do all of that with a machine on wheels that we roll around the hospital or ship on trucks.

We've also looked at, but have not fully developed, mobile dialysis in a trailer that could sit outside of a hospital, fitted out to include five or six dialysis machines. No dialysis company has bought into this—it's expensive, and in addition to the cost, we have to think about its utility. If we move this unit to an area that has been affected by a disaster, and dialysis capabilities were wiped out, why are we there in the first place? Our focus should be on getting patients out of the area.

There are three primary factors we must consider when it comes to mobile dialysis. First, do you have access to electric power/can you get it? Next, do you have access to (a lot of) water? The average treatment uses between 65 and 85 gallons. There are some machines in development that use less water, but they are not ready for disaster use yet. And, finally, can you properly dispose of/drain the used water?

In PR, many patients do their dialysis at home, using a dialysis machine, a gravity-fed program, or a cycler that helps cycle the fluids in and out of their bodies (this is called CCPD). The majority of our PR patients were CCPD, and while that is similar to mobile dialysis, these patients didn't have electricity and had to bring their cyclers into the dialysis facilities. I was pushing those patients to get to a shelter where they could then be transported to the operational dialysis centers to prevent infection due to lack of running water and power at their homes. This was met with some resistance, so we did provide personal generators. While this is not my preference, sometimes we have to give in to the doctor and patient who convince us they can perform dialysis at home.

JH: What are you incorporating into your plans based on lessons learned from this situation?

BN: Communication with the EOC in PR was not as good as we wanted it to be. Prior to the storm, it wasn't up to par, either. Working with the command center and trying to get their attention was a bit more challenging than we expected. They were getting their water, diesel, and gas from the same sources that we were, so while we had access to those locations, we weren't prepared enough ahead of time and hadn't made it clear that we also needed these resources; in some cases these resources were allocated to other locations. In general, our main challenge was communication—this was the first time we could not communicate to large geographic areas for more than a day (or in some cases, many days). We are working on other communications options. We recently met with HAM operators in PR, and the Coast Guard has been helpful with communication.

A single chair in a dialysis clinic can handle either two patients per day in a ten-hour shift or three patients per day in a sixteen-hour shift. In emergency situations, a ten-hour day usually works best because staff and patients can travel in the daylight and avoid challenges with power issues. Three patient shifts per day are appropriate if the infrastructure is stable and power is reliable.
To serve 80 patients a week at a clinic that is open for ten hours per shift, we would schedule 40 patients on Monday, Wednesday, and Friday and 40 patients on Tuesday, Thursday, and Saturday. This set-up would require 20 dialysis stations (chair and machine).

Editor's Notes: This interview highlighted the role played by a key private partner in the response to unprecedented challenges faced when evacuating dialysis patients after 2017's devastating hurricanes. Planners should consider the robust and relatively mobile resources these agencies have and incorporate them into their exercises and materials. While moving supplies around CONUS is relatively easy and done quite frequently, we quickly learned that getting dialysis supplies to more remote OCONUS areas poses an array of challenges, often making evacuation a safer and more cost-effective solution. ■

When Hospitals Become Islands: One Facility's Evacuation Story

Abstract: *Hurricane/Tropical Storm Harvey struck Houston and surrounding areas more than once, dumping close to 60 inches of rain over a wide swath of the area in just a few days. Hospitals became islands, roads were impassable, and military and public safety helicopters were brought in to evacuate people from their rooftops. Todd Senters (MHA, FACHE, Service Line Administrator and Facility Administrator at Baptist Beaumont Hospital's [BBH] Orange Campus) shares how staff in his facility worked tirelessly to care for existing patients (and those who were dropped off by helicopter) just prior to having to evacuate due to a breach in the City of Beaumont's water pumps.*

John Hick (JH): Please describe your background, your current role, and how that played out during the evacuation.

Todd Senters (TS): I was actually born at BBH and raised in Beaumont. My schooling and work took me to different areas of the state, but I've been with BBH for the past eight years, serving as the Service Line Administrator. During Hurricane Harvey, I was the facility's administrator on call. We are a Level 4 trauma center (our facility's focus is more cardiovascular and neurology in nature); there is a Level 2 trauma center a few miles away from us.

JH: We know that there was tremendous investment in infrastructure after Tropical Storm Allison. Were there similarities between the storms?

TS: The storms took different paths but were similar in the fact that the rain came from an unexpected, unforeseen source and caught infrastructure off guard. The torrential amounts of rain were problematic in terms of getting supplies and personnel in and out in both storms. There was investment after Allison, but in Houston (90 miles away), there was more of a focus on installing storm doors in tunnels to block water flow. What had not been

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thought of before was that most of the switches and generators at Texas Medical Center were ground level. The newer buildings had them installed on roofs, and those buildings maintained power. This type of rain-making event was a brand new experience for Beaumont.

JH: Please take us through the event from your perspective.

TS: We have more patients that come from our secondary service area than our primary service area. We support eight separate counties that surround Jefferson County (where Beaumont is located). Our immediate area weathered the storm pretty well. We had some water intrusion that had to be mitigated, but we were in better shape than other hospitals in our market. The surrounding counties, however, were under water and there wasn't a single major roadway that was not completely submerged after this event. Our airport reported over 58 inches of rainfall. We were literally an island and couldn't receive supplies, even through the SouthEast Texas Regional Advisory Council's (SETRAC) Catastrophic Medical Operations Center (CMOC). Once it became necessary to evacuate, we flew out more than 200 patients via helicopter. We actually had nine medical helicopters on the ground at one time evacuating patients.

JH: How were air operations managed?

TS: We have some ER nurses that were also flight nurses and they knew how to prepare and clear landing zones. We had security do a sweep and clear our parking lots closest to the ER. We had people move their vehicles as necessary and we were able to cone off separate landing zones and communicate with local helicopters using traditional channels. That said, we were not able to communicate with the military Black Hawks involved in high water rescue—they are on a separate channel that we could not access. Sometimes they delivered patients and we weren't even sure what to expect, but we cleared the landing zones for them, too. Some evacuees they delivered had been rescued from their rooftops and had chronic medical conditions. We really didn't know until we triaged them. Sometimes we transported them to the FEMA shelters, and in some cases those shelters sent them back to the hospital for treatment. Some patients ended up sheltering in our facility for a bit.

JH: How did you maintain operations early on?

TS: Our communication (up to when we lost potable water) with SETRAC had been kept to a minimum because they were overwhelmed and we were able to manage on our own. Hurricane Harvey came on land as a Category 4 windstorm and did related damage, but as the high pressure pushed the storm to the Gulf and it hovered over the Gulf Coast and went back over the water, it began dumping bands of torrential amounts of rain onto Houston and the surrounding areas. It doesn't matter how prepared you are, or how these storms are classified—you can't be prepared for a storm that was never projected to behave that way. All the reservoirs and tributaries were already full, so the water had nowhere to go—it just sat there. It was a transportation nightmare.

> Dialysis patients presented us with a new challenge. Dialysis is essentially an outpatient service, and all of these facilities were closed. Many dialysis patients came to our ER because they had not been dialyzed for several days and they were very ill. We decided to fly them out after we lost water, and several of them deteriorated very rapidly. We ended up working with CMOC to pull those most critical patients off of the FEMA manifest; local medical centers were willing to accept five back-to-back renal patients who were in crisis via helicopters.

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We have a ride out team on campus made up of essential staff, including our management and senior teams and our Chief Operations Officer and CEO, to whom I report. We had strong representation from our medical staff on campus and had ride out teams in remote locations, too. The Level 2 trauma center up the road had become cut off from ambulance traffic and the roads to that hospital were not passable, so we had trauma traffic on top of our usual patient load (plus the Black Hawks delivering patients).

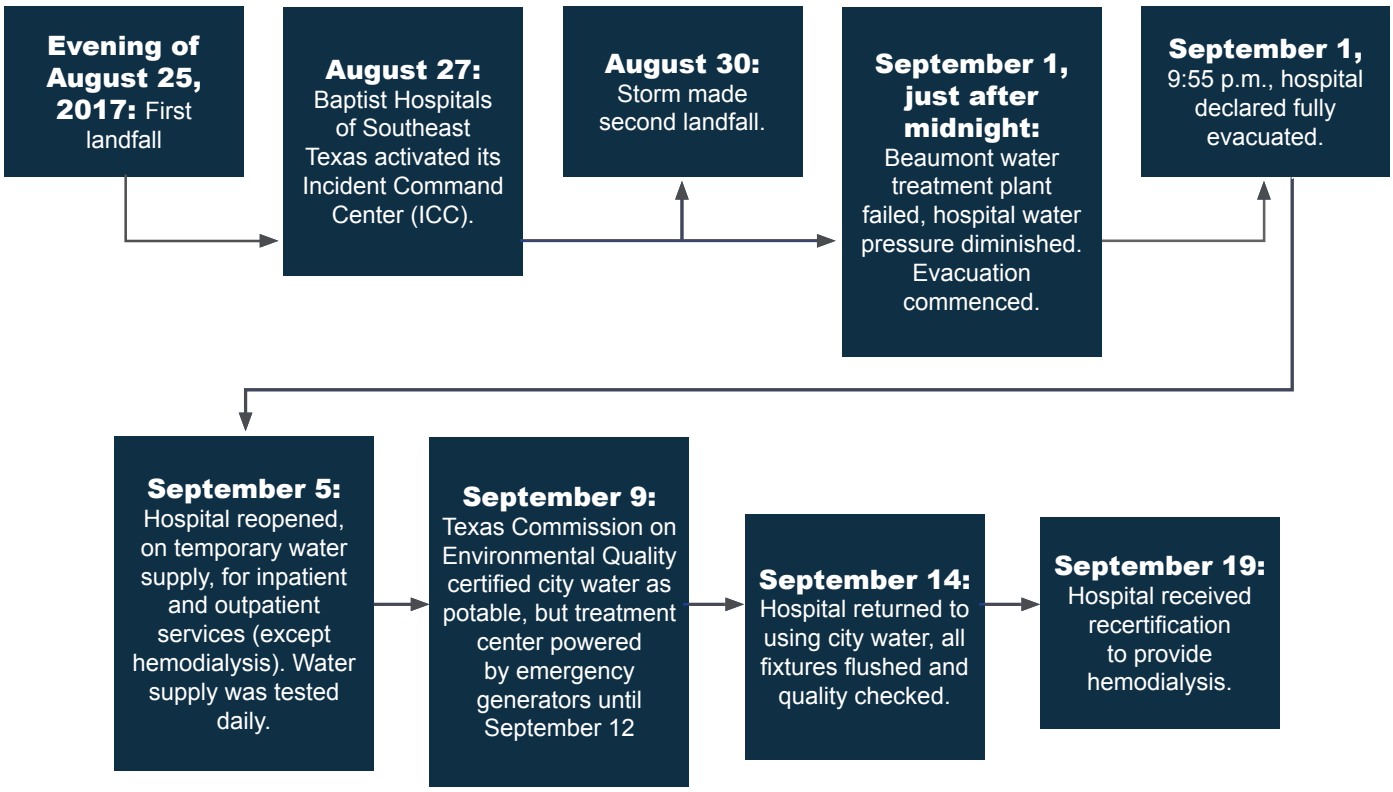
At the time of the storm, our inpatient census was 287. We had been taking on more patients over the days leading up to the storm because of the closure of home health agencies and outpatient facilities. We transferred all 287 patients—including 12 neonatal ICU patients taken by jet to an academic hospital—while keeping the ED open. Our estimated patient evacuation totals were:

- 40 by ambulance bus (ambus)
- 210-220 by air
- 40-60 by ground

Over the first 24 hours, we had no access to anything or anyone by ground. Even the 18 wheeler carrying our pharmaceutical supplies stalled out in high water.

JH: Walk us through your decision to evacuate.

TS: Until the storm made second landfall, we had been able to maintain operations. But once the city lost its backup feeder well, primary pump, and secondary water pump in a few hours, the situation changed quickly. We were notified about the city's loss of water at midnight going into that Friday September 1st; within 30 minutes the hospital lost water pressure. We went into emergency response mode, and notified CMOC and our county emergency coordinators that we had lost potable water. We



Landfall, Evacuation, and Recertification Timeline

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requested emergency water trucks, but CMOC was unable to secure a vehicle that could get through that much water. We knew we had deteriorating patients—we were sitting on top of one of the highest levels of acuity that this facility had ever seen. We had physicians round on the units and triage and categorize patients by severity. We notified CMOC of our pending evacuation, sent bottled water to the nurses to help them prep patients, but we were unable to dialyze patients or sterilize instruments, so we were unable to function as a higher-level care facility.

We were all gathered in one room, including the COO, CNO, and me, and we walked through the pros and cons of the situation. Had we known when we'd have operational water, we would have been able to hold off on the decision, but when you don't know, you can't put lives in peril and you have to make the decision to evacuate. It took us nearly 18 hours to evacuate the facility (this was not unexpected). Our initial hope was that we would begin the process and at some point, we'd receive potable water or the city could come back on line, but that never happened. We were without city water for 10 days. We were not operational for three days (but the ED was still open).

JH: Once the decision was made, what was the division of labor?

TS: During our initial communication with CMOC, we determined that we would use our resources to arrange for receiving hospitals for the majority of our patients and we would keep CMOC posted while they directed the air medical services. That's how things went for the first couple of hours. We notified hospitals with which we had standing affiliations/relationships. Most of them were able to provide beds, but we did run into some difficulty with communication channels. There were some storm-related challenges, and CMOC was not receiving our communication. We then had two individuals come in from leadership roles with State Emergency Medical Task Force Group 6. They helped us communicate with other facilities to help us evacuate our patients quicker. We stopped trying to identify receiving hospitals and CMOC took over that responsibility. Then the helicopters began to arrive, and we matched the patient with the flight crew's orders and paperwork before we released the patients.

What's interesting is that none of the hospitals were affiliated with Baptist Beaumont. Our parent company is Community Hospital Corporation (based in Plano), and we are one of their largest hospitals. We didn't have the right sister facilities close by so we made arrangements with other nearby facilities in a safe location (but not in our network). We learned that we should have turned that function over to CMOC earlier because they could have helped us place more patients at one time.

> You can never forget about the human element in a disaster like this, and that includes not just the individuals you're caring for but your staff as well. They need intermittent breaks to check in with family and get reassurance that everything's ok.

We would send over patient demographics and nurses would call the receiving facilities and provide reports. Someone there would be charged with taking reports (and arranging treatment and equipment ahead of time), the handoff, and resulting treatment.

JH: Did triage move smoothly?

TS: Overall, it did, but we always have to take into account the human element—a patient who is stable at 9:00 may not be stable at 11:00. We repeatedly had to make changes to our initial triage effort—as time went on, patients' statuses changed. A patient we thought was more critical might have become

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more stable later in the day. You find yourself having to change the order in which patients need to depart the facility, and you have to constantly reevaluate and adapt on the fly.

JH: How was this coordinated with the hospital command center?

TS: Our command center was communicating with CMOC who developed a list of flight arrangements per our patient manifest. Hard stop was at the ED—every flight crew that arrived checked in with the director of the ED and nurses from the floor brought the patients to the ED. The floor nurse handed the patient over to the flight crew and they performed a cross check to ensure the patient matched the manifest and process. This is what the ED is used to doing and does best, which is why we left this function with the director of the ED.

JH: Did you do 24/7 evacuations via helicopter or did you stop once it was dark?

TS: We did transport more critical patients after dark, but the majority took place during daytime hours. Some of the water had receded in the evening, so ambuses were able to make it through and we switched to ground transportation when we could.

JH: How did you address staff needs?

TS: Many of our staff don't live in Beaumont and many had homes that were under water and their families were evacuating. Cell service was not always reliable, so we did a good job rotating through staff pretty well. We had nursing directors whose units were closed who went to the ER to work and relieve staff. This allowed staff to work three or four hour blocks and then take a break to decompress. We created sleep rooms for staff where they could shower and change into fresh scrubs. Our dietary staff ensured staff had enough food, too. After the event, we provided staff with assistance filing claims for home damage and related issues.

JH: How did you address behavioral health needs of patients and staff?

TS: We have an acute psychiatric hospital on our campus (they lost resources at the same time we did). Social workers and counselors stayed behind to help walk our staff through their personal challenges, too. We have an incredible pastoral care team here who went above and beyond supporting staff. I saw more support among staff during this event than I ever have during an emergency. If someone was emotionally struggling to do their jobs, one of their coworkers would encourage them to take a break to regain their composure and take over.

Our psychiatric hospital includes a detox unit and a child behavioral health unit. While we were able to discharge some patients before the storm, we had about 35 patients there afterwards. We also worked to ensure that those patients were transported to appropriate psychiatric treatment facilities. Most of them were evacuated later in the day by ground. They were evacuated by ambus to hopefully alleviate any potential concerns associated with air transport (such as claustrophobia, pressure changes, loud rotor and engine noises, and other potential triggers). Our clinical care team worked very hard to personalize the evacuation process for each patient to match them with other patients to ensure they could get along in the same vehicle. We sent staff trained in de-escalation with this group of patients to facilitate the evacuation.

JH: Had you participated in evacuation exercises prior to this incident? What lessons did you learn from this evacuation?

TS: Because of the industries close to where we are (a large port and petrochemical plants), we prepare more for external disasters, like maritime or plant explosions, and patients coming in. We're used to being the safety

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net, and taking in patients, but not having to send them out.

One of the most interesting aspects of this event was realizing that the coordination between the military and civilian sides is not where it needs to be. We need to be able to communicate with them so that both groups can adjust expectations—both from the receiving and transporting ends. Also when arranging for evacuation, you're dealing with state, region, and federal government. We see and exercise with these local and regional individuals every day. But communication with state and federal resources was also strained.

We also need better local capabilities to keep our facility open, for example, a quick turnaround emergency certification of our water source that could keep our facility running. Sometimes you have to reinvent policy on the fly and I'm not sure we were as prepared to do that as we could have been. We could have kept our facility running—which was our end goal—had we been able to get clean water and connect pumps to our main. It took a long time to be able to source those types of components. But once you declare an evacuation, your focus shifts to making sure it happens the right way.

Another lesson we learned was that having just one command center doesn't always work well when you're trying to fix the ship AND take care of people at the same time. Some are dealing with vulnerabilities in the roof system and others are categorizing the most critical patients and arranging for air transport. You've got four or five people conversing about each task and if they're both in the same room, it just doesn't work. There is a need to create a sub-command center to manage patient care and report numbers back to the overall operational command center.

JH: Were there any issues with reopening the facility?

TS: No, that process was seamless. We had been running reservoir water tanks through our main for several days, processing laundry and getting different parts of the facility back on line. Opening the facility was the easy part. We'd already had patients in the ER, and we had checked the instrumentation. One of the greater challenges was having the city environmental consultant oversee our water quality process. Every single fixture in the facility had to be tested—sinks, commodes, showers—and this was time consuming and resource intensive.

You can't ever rest in the safety and assurance that things will go as expected, even if you've been through similar events. We write our plans by category and event, and everything on paper is mathematical and analytical. This storm threw that entire book about the window. By the time it hit us, it was a tropical storm, but it did more damage than other more severe (on paper) storms ever did.

Editor's Note: Water is one of the basic necessities of a hospital – and one of the most vulnerable. In this case, the evacuation had to be conducted mainly by air – an unusual situation and one that similar facilities should consider in planning. Conducting large-scale air operations such as these create unique issues and hazards that should be planned for in advance, and coordinating this degree of helicopter support can be difficult without pre-planning. The role of the CMOC is worth emphasizing, as a well-functioning coalition can address patient destination as well as transport coordination needs, allowing the affected facility to concentrate on managing their environment of care and preparing for evacuation. For any hospital in an area vulnerable to flooding, these experiences offer a wealth of concrete planning information. ■

Evacuating a Region: How a Healthcare Coalition Helped Evacuate 1504 Patients from 45 Facilities after Hurricane Harvey

Abstract: *Floodwaters from Hurricane Harvey inundated 23 out of 25 southeast Texas counties covered by the SouthEast Texas Regional Advisory Council's (SETRAC) Regional Healthcare Preparedness Coalition (RHPC). Many hospitals and nursing homes were evacuated while others closed their submarine doors, sheltered in place, and received critical supplies via helicopter and high-water vehicles. ASPR TRACIE interviewed Lori Upton (RN, BSN, MS, CEM), Director of Regional Preparedness and Operations for SETRAC, to learn more about healthcare facility evacuation from a regional perspective.*

John Hick (JH): Lori, can you please describe your current role at SETRAC?

Lori Upton (LU): I currently serve as SETRAC's Director of Regional Preparedness and Operations. We are the contracted agency for the Texas Department of State Health Services for the Hospital Preparedness Program. We cover three trauma service areas of TX, which include 25 counties, approximately 180 hospitals, 900 nursing homes, one tribal nation, and about 277 jurisdictions. We serve 9.3 million people.

My team includes an Assistant Director, three Area Coordinators (one per trauma service area), a Long-Term Care Coordinator who works with our nursing homes, and several educators.

JH: What kind of role does SETRAC play during an event?

LU: During an event the operational/response arm of our RHPC is the Catastrophic Medical Operations Center, or CMOC. This includes 13 members that are made up of SETRAC staff, Regional leaders, and hospital representatives. The CMOC can only be activated by a jurisdiction having authority, by a public health authority, or by the State of Texas. Hurricane Harvey was considered a Level 1 activation, so our staffing included: an operations chief, a logistics chief, a clinical director, our transportation sector coordinators (air and ground), a regional public health liaison, and five hospital representatives.

> The CMOC is a Regional asset, written into our Regional catastrophic plans and our UASI plans. It's owned by SETRAC and is validated by the Office of Emergency Management through an agreement.

When those representatives enter the CMOC, they lose their facility's identity and function as regional entities, looking out for all hospitals within a certain geographical area that they're familiar with because they've been planning with them.

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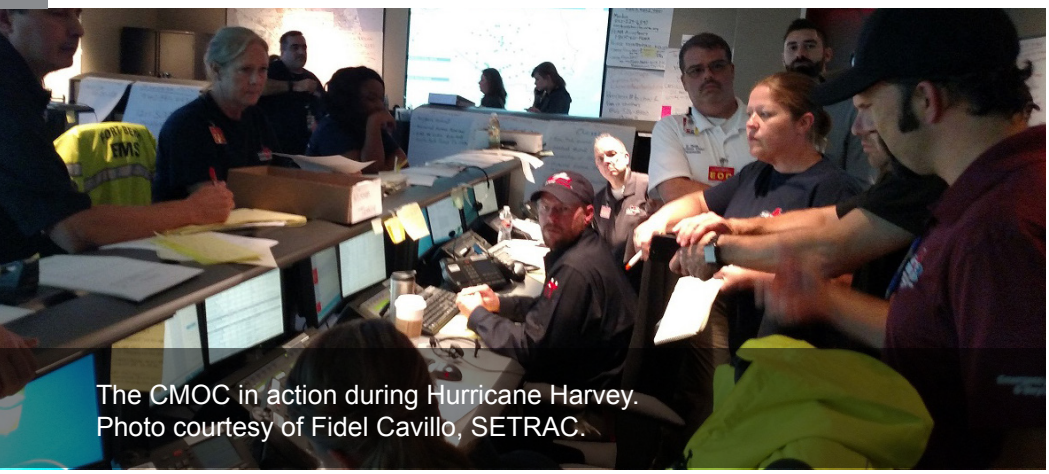

The CMOC in action during Hurricane Harvey. Photo courtesy of Fidel Cavillo, SETRAC.

The role of the CMOC is to carve out the medical component while working within the overarching scope of ESF-8. This ensures that medical needs are not in the same queue as debris management, for example, and are addressed separately and appropriately by medical personnel. This has worked very well in our area. The Region and state use the same software program for notification, information gathering, and bed reporting every day. In fact, today, we are using it to handle our IV solution shortages. It is also used by EMS agencies to identify capabilities and capacities within each hospital in the area. This makes for a very easy transition during disaster time. All hospitals can push critical information to the CMOC using our communications system and this can be pushed back out to the entire region and state if necessary.

During an emergency situation, if a hospital was experiencing an internal disaster or considering evacuation, they would change their facility status in our notification system. The system would then send a notice to SETRAC as well as the Office of Emergency Management in the county or city where that hospital resides so they know there is an issue. Our duty officer then contacts the hospital to see if there is any assistance we can provide to keep them running. If we can't fill the request regionally, we push the request up to our Disaster District Chair, who is our link to the state.

JH: Walk us through Hurricane Harvey and the flooding event from your perspective.

LU: In the beginning, we shared the information through daily conference calls with healthcare providers and nursing homes. During these calls, we'd provide status updates, recommend protective measures, and share the number to call in case they decided to evacuate a facility. We also let them know we would be checking in with affected facilities regularly regarding their decisions to shelter in place or evacuate. If they said they were sheltering in place, we recommended they had seven days' worth of supplies and equipment. If they said they were evacuating, we asked them if they had enough resources and a place to go, and we asked them to let us know when the last person leaves so SETRAC could ensure they were safely out of harm's way. We also told facilities that if they had to change their plans, call us back, and we will help you identify alternate locations and assets to help move patients.

We track patients that we move two ways. During Hurricane Harvey, we relied solely on the virtual mission task board we had built for us in WebEOC, which can be used to gather information, make bed assignments, and provide data to the transportation sector (which then looks at closest staging locations and assigns ambulances to transport and keep the mission moving). It also allows us to identify points of contact once the patient arrives at their new location.

We also use "EMTrack," which allows us to begin tracking patients as soon as they enter the hospital. This provides a more accurate data picture—we found it makes more sense to start tracking when patients arrive at the hospital, rather than when they leave an incident site.

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JH: What happened with Ben Taub Hospital—was their evacuation cancelled because of floodwaters?

LU: Ben Taub was prepared to shelter in place, but they contacted us early on—there had been a sewer breach and water had gone into the lower level where they stored food and other supplies. This hospital cares for some of the most critical patients in our region; they are very fragile to move and it is hard to find a like acuity facility to receive them. First, we considered using a helicopter to drop food sources at the hospital next door, then transport them to Ben Taub so they could feed patients and staff. As we were working on these logistics, we were also working with the staff to determine which of the more critical patients to evacuate if necessary. We were only able to evacuate some of the five patients we wanted to move before the water came in and prevented ambulances from being able to access the area.

JH: Can you tell us what happened with Beaumont Baptist Hospital?

LU: They were also affected by quickly rising waters. Our Region was hit three separate times by Hurricane Harvey's rains. On the third round, the water caused many hospitals to basically become islands. In Beaumont the city's water pumps stopped functioning. Without the ability to pump fresh water, they decided to evacuate the hospital. We received their patient manifest and helped prioritize patients for evacuation. The Beaumont area is east of Houston and there is just one major highway that comes into that area (I-10, which was under water at that point). We had two choices: take patients north or continue east into Louisiana (LA). Many patients were evacuated to LA; fewer went to facilities north of Beaumont. Once Beaumont Baptist decompressed, they brought in water trucks to take care of remaining patients and staff. These trucks were brought in on ferries and changed nearly daily, since they only had 5,000 gallon capacities (not enough to run a hospital for very long). For the most part, people and supplies were moved using helicopters, and some supplies were brought in via ground travel from LA.

JH: How did you figure out who had beds available for Beaumont patients?

LU: Baptist Beaumont had identified several hospitals in LA that were capable and agreeable to accepting their patients. The ambulance service that normally serves the Beaumont area also has operations in LA so transportation fell together nicely. We can get bed reports from the State of Texas, but not usually LA. We have a good working relationship with LA Public Health so facilitation of patient movement was easier. Once residents were ready to be discharged home from their original hospital, shelter, or receiving hospital, we had to ensure the home they were going back to was habitable and had functioning utilities as well as a point of contact to receive that person. This was accomplished through coordination with our CMOC, Medical Incident Support Team (MIST) members, and local public health and emergency management.

1504 patients were evacuated from **45** facilities in the SETRAC Region.

JH: What were some overall challenges or lessons you learned from this experience?

LU: Our biggest problem was access. This was a flooding event with up to 60 inches of rain. We had established staging locations for ambulances coming in under state and federal contracts, but as the water continued to rise, the staging locations were threatened, so we continued to move west of the city. As we moved west, the water kept following us, so it took us several days to get to some patients because of the rising water. Roadways in 23 out of 25 of our Region's counties were completely impassable.

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We did identify some shortfalls. We need some high-water vehicles and we need to improve coordination with air transport and rescue providers. We also need to improve coordination with our federal partners, particularly when they bring in the helicopters and high-water vehicles. While everyone was doing what they needed to do, at times we lost sight of the whole picture because there were so many moving parts moving in their own spheres.

We are currently refining some of our WebEOC boards so that we have more robust information. This was completely different from Hurricane Ike (2008), where we had 56 hospitals and 200 nursing homes evacuated. After Harvey, while we only evacuated 20 hospitals and 25 nursing homes, the struggle was greater because of the quickly rising water and our inability to reach people.

That said, we've put a lot of mitigation and planning efforts into the Texas Medical Center since Tropical Storm Allison hit in 2001.

> At first, search and rescue teams were rescuing people from their homes and bringing them to hospitals, which weren't ready to shelter 600 people in addition to existing patients and staff. Hospitals should never be used as a sheltering location.

Staff evacuate a medical facility.
Photo courtesy of Chris Collier, SETRAC.

They've got submarine doors in place and monitor bayou cams—once the water hits a certain level, all hospitals close their submarine doors to block rising water. The green space that surrounds the Texas Medical Center has been dredged lower to help retain more water, and parking garages help serve as reservoirs that can hold water (versus it flowing into lower levels of healthcare facilities).

JH: What was the interface like between ESF-8 and ESF-6?

LU: We've been able to apply lessons learned along the way. Texas holds a contract with Baptist Children and Family Services (BCFS) for medical sheltering. BCFS brought staffing and equipment to open a medical shelter at Reliant Stadium. Harris County also opened a general shelter with a medical component. The City of Houston opened a large shelter at the convention center with a medical component. Our schools of nursing and medicine helped staff those facilities. So did the state contract. These three served as big regional shelters which alleviated a lot of strain on some of our smaller communities. Once we got patients into these medical shelters, it was much easier to get them the services they needed while keeping them closer to home.

JH: Who is responsible for providing medical shelter in Texas?

LU: Public health handles providing medical shelter, and the shelters are staffed with contracted services—a private group that provides staffing and oversight—which is managed by the State of Texas. Local public health departments are responsible for opening and supplying the shelters. We had Disaster Medical Assistance Teams (DMAT) on site and FEMA also stood up the Federal Medical Station (FMS). Our medical shelters resembled little hospitals—we referred to DMAT as the emergency

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department. If patients needed more critical care, they were taken to hospitals. If they were relatively stable, we sent them to the FMS (the "wards" in the shelters).

Caring for Responders

The Medical Unit Rehab Crew ("MUR-C") Team is a medical care team responsible solely for first responders. This relatively new concept started in 2016 during a major flooding event in East Texas. Our ambulance bus, or ambus (vehicles that can transport up to 20 supine patients with full medical support), was deployed with CMOC, and responders working the scene went to the ambus for care. The Medical Director for that agency suggested adding a team dedicated to caring for responders to our regional response program.

After Hurricane Harvey, we sent mobile medical units to several counties. Once responders began to demobilize, they reported to the stadium and were checked out there. If they didn't feel well, we sent them to the MUR-C Team for further treatment. In one instance, we had nine staff members with norovirus symptoms. In addition to treating them, we were able to quickly send more handwashing stations and related supplies to the field.

JH: Where were supplies staged and distributed?

LU: FMS brought supplies, but we also had a lot of donated medical supplies stored in warehouses. We sent those to our staging location at Reliant Stadium. On stadium grounds, we had a Harris County Public Health medical shelter, the county's general shelter, and a large, state-run medical shelter. The central ambulance staging area was also located on the grounds (complete with logistics needs and fuel tankers), as was a helicopter loading zone for patient movement.

JH: Are there any changes being made to evacuation plans as a result of lessons learned?

LU: Overall, hospitals did an excellent job. They've been doing a lot of training and exercising over the past eight years, and they've also been working on hardening facilities. But I think they realized that they need to be a part of the coalition so they can better understand their role in overarching plans. One of our biggest current priorities is getting nursing homes involved in the coalition and working specifically on evacuation planning and asking for assistance.

After Hurricane Rita, some nursing home patients were temporarily unable to be located. We realized we needed to have a system in place to identify and track them better—particularly those who self-evacuated and maybe wandered off—so we began our Pink Vests program. During Harvey, the media shared photos of nursing home residents sitting in wheelchairs, waiting to be evacuated. I looked at those photos and realized they were doing what they were supposed to—they had their vests on, and their facilities were activating their evacuation plans, but the water rose before they could fully evacuate. Now we need to understand how to harden facilities to ensure patients and staff can evacuate in a safe manner. We have a preparedness boot camp every quarter for nursing homes and long-term care facilities where we teach them about: emergency communications, the CMOC, writing emergency and evacuation plans, the vests, and their role in regional response.

JH: This level of coordination requires a sophisticated knowledge of the CMOC—who staffs it? Who backs you up?

LU: Our staff assumes several of the roles in the CMOC and we augment from our hospitals and EMS agencies for the transportation sector and corridor coordinators. The state's Disaster Medical System includes Medical Operations Centers and the Emergency Medical Taskforce (EMTF). One component of the EMTF is the MIST. Because Harvey affected so many of our

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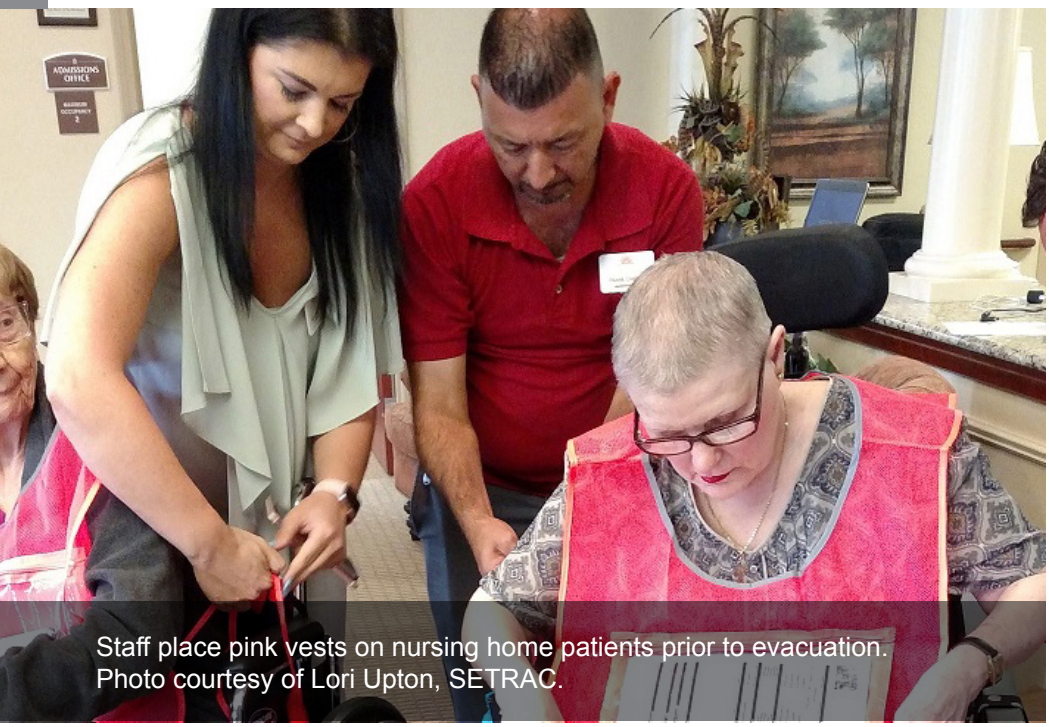


Staff place pink vests on nursing home patients prior to evacuation. Photo courtesy of Lori Upton, SETRAC.

hospitals, we pulled from MISTs to staff the CMOC. To belong to a MIST, you have to go through training, either as medical hospital personnel or an EMS personnel. They've been heavily trained and deployed before. Ambulance staging areas are staffed by our staff as well as members of EMTF trained as Ambulance Staging Managers.

JH: Can you tell us about the coalition's role in recovery?

LU: Most of our facilities are back up and running. We completed a lot of damage assessment query forms towards the end of the initial response phase. These forms are available on our emergency management resource site. We ask all of our hospitals to complete those and send them back to us. The data we collect includes the type of physical damage the facility suffered, how much business interruption occurred, overtime staffing and supply expenses, and other financial losses as a result of this event. Those numbers are shared with the facility's county which then includes the data in their county-wide damage assessment claims, submitted for federal declaration and reimbursement support.

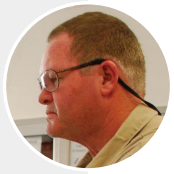
Editor's Notes: The CMOC is one of the best national examples of a coalition-level multi-agency coordination center that addresses medical issues across multiple jurisdictions and has proven value in multiple large-scale events in the greater Houston area. The functions of information coordination, patient tracking, evacuation coordination and support and resource management are the very functions all coalitions should ensure they can provide during a disaster response. Depending on the size of the coalition and its resources, these may be based in a jurisdictional EOC, conducted virtually, or have their own dedicated space like CMOC, and personnel may be acting on behalf of the coalition, or as a lead for public health, EMS, or other agencies in their "usual" role while also representing coalition interests.

It's worth noting that the flooding from Harvey would have been catastrophic for the region's medical services if not for the lessons learned and investment (estimated at $1 billion) by medical centers into facility hardening after Tropical Storm Allison in 2001 – a true mitigation success story. Many other best practices in alternate care site integration, long term care patient identification, responder care, and expense documentation are also noted in Lori's account. ■

Access SETRAC's Damage Estimate Query Form here!

RECOMMENDED RESOURCES

TECHNICAL RESOURCES



ASPR TRACIE recently released Topic Collections on Training and Workforce Development, Coalition Response Operations, and Electronic Health Records. Be sure to bookmark our page that includes all comprehensively-developed Topic Collections, as it is updated often. You can also learn more about rating, commenting on, and saving resources in this short tutorial.

ASSISTANCE CENTER

When several disasters occur simultaneously, the pull on medical resources can be challenging. Access the webinar Clinicians and Coalitions: A Conversation about Finding Solutions for Medication Shortages to learn how your colleagues are identifying and addressing shortages in their communities and facilities. Need to conduct a healthcare coalition gap analysis or draft a plan? These tools can help. Access our updated summary sample of TA requests which now includes internal hyperlinks that quickly take you to the information you need. For assistance navigating the Assistance Center, check out this tutorial!

INFORMATION EXCHANGE

Register for the ASPR TRACIE Information Exchange, where you can click on a variety of threads and share your opinions and resources with us and your colleagues. Already have an account? Simply log in and share your feedback! Need help registering for the Information Exchange? Access our quick tutorial!

UPCOMING 2018 EVENTS

The FEMA Center for Domestic Preparedness, in collaboration with ASPR's Division of National Healthcare Preparedness Programs, has developed a one-day, eight-hour Health Sector Emergency Preparedness Course. The course is designed to provide training to healthcare providers and suppliers in the achievement of the four core elements outlined in the September 2016 Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers Final Rule. Access the syllabus for more information.

CMS' on-demand Emergency Preparedness Basic Surveyor Training Course is required for all State Survey Agency (SA) and Regional Office (RO) surveyors and reviewers who conduct or review health and safety or Life Safety Code surveys for emergency preparedness requirements. Non-survey professionals and other SA or RO support staff responsible for ensuring compliance with regulations are also encouraged to take the course. Access the course on the Integrated Surveyor Training Website. Contact the website's help desk for technical assistance.

March

March 16-17; Tampa, FL
Accreditation Association for Ambulatory Health Care (AAAHC) Conference

This two-day seminar can help organizations prepare for the AAAHC survey.

March 26-29; Orlando, FL
National Hurricane Conference

This conference provides attendees the opportunity to improve hurricane preparedness, response, recovery, and mitigation in order to save lives and property.

March 27-28; Omaha, NE
Emerging Infectious Disease Preparedness Workshop

This workshop (hosted by the National Ebola Training & Education Center) will provide information and tools on the many aspects of managing and maintaining readiness of a facility responsible for assessing and/or treating patients with a special pathogen.

April

April 11-13; Minneapolis, MN
Healthcare Systems Research Network Conference

Presenters will showcase scientific findings from network research projects geared towards improving individual health and healthcare.

April 17-20; Atlanta, GA
2018 Preparedness Summit

This year's theme is "Strengthening National Health Security: Mastering Ordinary Responses, Building Resilience for Extraordinary Events." Check out the ASPR TRACIE Quick Hit Session: "ASPR TRACIE: Resources to Help Build Resilience for the Expected and Unexpected" and our poster presentation "The Best Disaster Medicine Literature of 2016."

April 23-24; Washington, DC
National Hospice and Palliative Care Organization Management and Leadership Conference

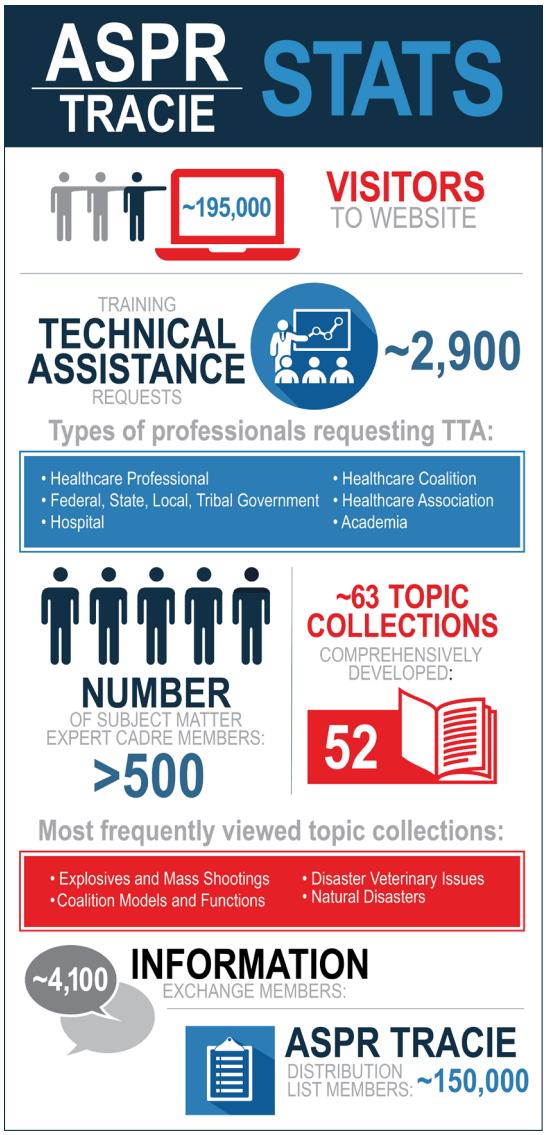
Participants will learn about challenges and opportunities facing today's healthcare landscape and what the future of healthcare holds as it pertains to hospice and palliative care.

ASPR TRACIE:

Your Healthcare Emergency Preparedness Information Gateway

The Exchange is produced by the Office of the Assistant Secretary for Preparedness and Response (ASPR) Technical Resources, Assistance Center, and Information Exchange (TRACIE). Through the pages of *The Exchange*, emergency health professionals share firsthand experiences, information, and resources while examining the disaster medicine, healthcare system preparedness, and public health emergency preparedness issues that are important to the field. To receive *The Exchange*, visit https://asprtracie.hhs.gov/listserv and enter your email address.

ASPR TRACIE was created to meet the information and technical assistance needs of ASPR staff, healthcare coalitions, healthcare entities, healthcare providers, emergency managers, public health practitioners, and others working in disaster medicine, healthcare system preparedness, and public health emergency preparedness. The infographic illustrates ASPR TRACIE's reach since launching in September 2015.



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