

Adapting a Plan: The City of Houston's Emergency Shelter During Hurricane Harvey

By Christina Shibu



Houston Fire Department EMTs administer aid to a Hurricane Harvey evacuee in front of the George R. Brown Convention Center shelter. Emergency medical personnel and doctors treated patients for many different issues from dehydration to mental health issues and chronic illnesses.

Photo courtesy of Diana J. Rodriguez.

One week in the latter half of August 2017, Houstonians witnessed two vastly different sides of nature. On August 21, as schools resumed classes, adults and students alike were awed by the solar eclipse that occurred that day. Four days later, Hurricane Harvey made landfall at Port O'Connor, Texas, and forever changed the lives of Houstonians.

In many ways response to Hurricane Harvey reflected the city's communal spirit. As residents were rescued from their flooded homes and moved into shelters, city health officials managed public health needs, hospital treatment, and disease prevention. While many shelters provided refuge to evacuees, the George R. Brown Convention Center (GRB) unexpectedly became a mass shelter on Sunday, August 27, housing approximately 11,000 residents over a twenty-two-day period and providing them a much-needed lifeline.¹

The city's original plan for a storm emergency involved "work[ing] with the American Red Cross and a number of other community partners to have large shelters set up around the city," explained Dr. David Persse who serves as physician director for the Houston Fire Department Emergency Medical Services (HFD EMS) and as the public health authority for the City of Houston. Overseeing disaster preparedness in both of his roles, Dr. Persse observed, "When Harvey hit, those shelters all stood up exactly according to plan ... except they filled up almost immediately."

cots [and] no supplies for disaster preparedness." Dr. Persse emphasized, "The disaster doesn't read your plan ahead of time. You find that your plan never matches exactly your needs. But if you understand your assets, whether it be a piece of equipment or a concept in a plan, ... you will be able to then apply it, perhaps in a twisted, changed fashion, to meet the need that you have during the actual disaster."² This philosophy captures how GRB functioned during Hurricane Harvey. Intended to accept 5,000 evacuees, it took in more than twice that number.

Once the City of Houston decided to activate the temporary shelter at GRB, organizations like EMS used all the tools at their disposal to open it. Emergency medical professionals come into a disaster equipped with assets such as training, experience, and departmental resources to prepare for multiple types of scenarios. Additionally, all EMS healthcare providers and first responders participate in mock drills, so that they enter a disaster zone equipped with the skills and knowledge to serve those in need.³

Emergency planners use lessons learned from previous disasters to plan future responses. For example, following Tropical Storm Allison in 2001, which was Houston's worst flood prior to Harvey, EMS set up a new communication pathway with federal officials trained in healthcare to ensure that proper medical equipment and supplies were quickly shipped to disaster-affected areas. Furthermore,

As a result, even though the city had used the convention center as a shelter in the past and planned never to do so again, circumstances forced officials to convert GRB to a shelter, despite the fact it had "no



Within a few days of opening the shelter, a Federal Medical Station from the Strategic National Stockpile was set up in GRB to accommodate patients with acute medical needs.

Photo courtesy of the Center for Disease Control.

HFD regularly updates its technologies and rescue methods, such as the use of swift-water rescue teams and high-water vehicles to reach neighborhoods with rising water.⁴

To get a glimpse into the EMS team members' effort, Dr. Perse and three of the doctors shared their experiences with the Resilient Houston: Documenting Hurricane Harvey project. Dr. Chris Souders, associate medical director of HFD EMS, described their initial medical role and how it expanded: "We started with having an EMS unit or two there, and then setting up a table with a couple [of] nurses and first aid." Into the second day, however, "it basically got overwhelmed" as people's needs grew more complex.⁵ As the number of GRB patients expanded, additional healthcare workers arrived and addressed specific patient needs while the team of EMS doctors took on a more administrative role.

Part of GRB was transformed into an emergency room as donations from local communities started pouring in; among them were food, cots, and privacy curtains. Hotels provided towels and blankets, as well as laundry assistance. Medical supplies, including oxygen tanks and medicines, came in from a variety of donors, such as corporations and local pharmacies. The GRB refrigerators once used for food and beverages stored medications instead. Dr. Souders remembered receiving "mountains of donations."⁶

Federal aid also arrived at GRB. Disaster Medical Assistance Teams (DMATs), which are Federal Emergency Management Agency (FEMA) entities comprised of doctors, nurses, technicians, and other staff members, arrived a couple of days after the shelter opened and provided intermediate-level patient care. Additionally, FEMA's ambulance strike team helped transport patients to hospitals when needed.

Because hospitals were receiving patients with flooding and regular health emergencies, the EMS doctors designed a triage system at GRB to accommodate hospital-bed availability. Dr. Lars Thestrup, assistant medical director for

HFD EMS, pointed out, "For my dialysis patients, I didn't want to send them to the ER when our hospitals were functioning at 100 percent capacity. Instead we had to come up with a different plan to ensure they were dialyzed regularly while staying in the shelter." Thus, the doctors triaged GRB patients based on acuity: lower acuity patients, who had less urgent needs, received care from family practice physicians; and higher acuity patients, who had urgent needs, were treated by emergency physicians and other specialists or were transferred to hospitals when appropriate.⁷

Doctors addressed a variety of medical issues while GRB operated as a shelter. A significant number of patients needed dialysis, but other illnesses, sometimes chronic, were also treated. Dr. Kevin Schulz, assistant medical director with HFD EMS, recalled, "We ended up actively managing sixty-two dialysis patients out of the shelter by the time we were at our full capacity." Dr. Thestrup remembered, "We saw everything. We saw eclampsia. We saw a stroke. We saw people having chest pain, shortness of breath, lacerations, and psychiatric [issues]." Furthermore, to prevent the spread of infectious diseases — especially the norovirus which can spread quickly in confined areas — professionals from the Houston Health Department (HHD) continuously monitored for signs of infection.⁸ Aside from regular ambulance transport services, care rendered by HHD and HFD EMS was not billed. Instead, medical providers prioritized helping people regardless of their ability to pay — a testament to the city's unity in the face of disaster.

Professionals from the Baylor College of Medicine Department of Psychiatry catered to patients' mental and behavioral health needs. Many patients struggled to cope with their losses, some had pre-existing mental illnesses, and others evacuated without their medications. Dr. Perse described the issues patients faced in the long term, observing, "People are realizing they're not going to get back into their homes soon ... that they're running out of money, that



Planning for the next storm includes examining what did and did not work previously. In 2018 Dr. David Persse, public health authority for the City of Houston (left), and Steven Williams, head of the Houston Health Department (right), evaluated the local storm response in a panel sponsored by the U.S. Department of Housing and Urban Development (HUD).
Photo courtesy of HUD.

the federal aid is about to end, and that they've got more problems. They're emotionally fatigued. They're exhausted." After working with patients at GRB, professionals in the Department of Psychiatry screened for at-risk patients and intervened medically through outpatient clinics and other Houston-area hospitals.⁹

The types of care provided at GRB did not stop there, as Dr. Schulz shared: "The UT School of Dentistry has a mobile van where they do dental check-ups and minor procedures. By the end of the second week, they were pulling up outside. ... Somebody else was doing eye exams and making glasses for people who needed glasses right there on the spot." Although these additional resources were not necessarily



Private and public ambulances provided services for patients who, after being evaluated by doctors onsite, needed transport to hospitals.
Photo courtesy of Diana J. Rodriguez.

needed the moment the shelter opened, the professional services provided to the evacuees proved highly valuable. Dr. Thestrup called it "divine intervention, a lot of luck, and a lot of miracles" when help that was not necessary in the present moment somehow showed up when needed in the future. Apart from tending to patients' medical needs, GRB offered several other services. For example, HHD assisted evacuees with FEMA

enrollment and housing aid, while the Missing Person Center helped locate missing loved ones.¹⁰

Even though a mass shelter generally is not considered a joyful place, many professionals and volunteers found working at GRB rewarding, with moments of hope and laughter emerging unexpectedly. Dr. Schulz shared some of those moments, "I came in one night, and there was a guy out in the main foyer giving haircuts. He had set up a folding chair and put up a sign that said, 'Free haircuts,' and he had a line down the hall." He also recalled, "walking through at about two o'clock in the morning, [and] there were fifteen or twenty people having a little karaoke party."¹¹

When the shelter closed, HHD ran its Multi-Service Centers (MSCs) and established Neighborhood Restoration Centers (NRCs), which provided services similar to those rendered at GRB. In the three weeks during and after Harvey, MSCs assisted nearly 5,000 people in procuring food, shelter, transportation, and other services. Furthermore, HHD expanded relief efforts in hardest-hit neighborhoods, like Kashmere Gardens, establishing a dozen NRCs after mid-November. These centers assisted hundreds of clients daily, providing information, resources, and health services, as well as strengthening long-term neighborhood resilience.¹²

Responding to those affected by a disaster is a team effort, and strong leadership from beginning to end is critical to managing a shelter for thousands of evacuees — especially one that was not part of the original plan. To adapt to the circumstances, Dr. Persse explained, "Sometimes you have to inspire your team members to do something which they've never been asked to do before. And you have to do it in a way that you impart confidence to them ... and every time you do that and you succeed, your team becomes a little bit more courageous, a little bit more resilient." Echoing that assessment, Dr. Thestrup pointed out, "There was nothing conventional about what we did [at GRB]." He found it particularly rewarding to see that when they employed their resources (large or small) it allowed the "typical plans to kick into place."¹³

Every health professional at the shelter had a mission to serve the needs of the patients in the disaster no matter the circumstances. Dr. Souders stressed, "We got into EMS to take care of all patients. We don't care about their insurance, who they are, or where they are. So, this is really just an extension of that in my mind. And these are people having a horrible day — maybe the worst day of their life ... Once you were here, we were going to help take care of you."¹⁴

The work done at GRB captured a portion of the overall public health response to Hurricane Harvey, and it also portrayed Houston's community spirit through individuals and organizations uniting around their expertise and resources to serve the vulnerable in a time of need.

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