

Once Upon a Storm: Katrina and Nutrition Support or the Lack Thereof

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Abstract

Nutrition support teams face many challenges to establish, fund, maintain, and justify their existence. Some of the challenges can be resolved over time. However, the challenge of providing nutrition in general and nutrition support in specific during a natural disaster is void of the luxury of time experienced with the previously delineated challenges. The experience of Methodist Hospital in New Orleans, Louisiana, during Hurricane Katrina in 2005 in providing nutrition and nutrition support is summarized in this invited article. The recollections of various represented disciplines are bolstered by tables and figures that outline the 7 days before and after Katrina. Transdisciplinarity was exhibited through the performance of nontraditional functions or tasks by a variety of professionals who lived 5 days or longer in the “Methodist Island.” Lessons learned and considerations for disaster preparedness as it relates to nutrition and nutrition support as well as general considerations are provided. (*Nutr Clin Pract.* 2014;29:595-604)

Keywords

nutritional support; disaster medicine; disasters; disaster planning; enteral nutrition; parenteral nutrition; transdisciplinarity

Background

Nutrition support teams (NSTs) and nutrition support in general have faced challenges since their inception. The challenges encountered in the development of parenteral nutrition (PN; aka, hyperalimentation) are chronicled elsewhere.¹⁻⁴ The explosive growth of NSTs in the late 1970s and 1980s was associated with the challenges of acceptance, funding, and members’ competency, among others. Major challenges were faced in justifying the existence of the emerging technology and the NST—initially under a cost-based reimbursement system, then under the Prospective Payment System and Diagnostic-Related Groups methodology established in 1982–1983, and now undergoing another metamorphosis with healthcare reform.

The aforementioned challenges were anticipated and the various institutions and teams had time to develop strategies and time to plan for them and alter their course. Natural disasters, on the other hand, afford little if any a priori notification. In the case of tornados, earthquakes, avalanches, tsunamis, massive fires, mudslides, and so on, there is no or only minutes of warning, and reactions to them center on immediate survival of the potential and often catastrophic events.

Hurricanes, on the other hand, are usually associated with several days of warnings, albeit requiring frequent updates to modify action plans. The following is a narrative of the experience of Methodist Hospital in New Orleans during Hurricane Katrina with emphasis on the management of patients in need of nutrition support.

Methodist Hospital in New Orleans, Louisiana (aka, Pendleton Memorial Methodist Hospital)

The hospital was built in 1968 with the addition of 2 floors in 1975 and a 6-floor East Tower in 1994. It was a 313-bed capacity facility with an average census of 140 patients. The initial tower had a backup generator located on the ground floor, not uncommon in older New Orleans hospitals. The East Tower’s generator was located on the roof with a 10,000-gallon diesel fuel tank and pump located on the ground floor. The New Orleans and Methodist experience during Hurricane Katrina in August 28–September 2, 2005, is summarized in Table 1.^{5,6}

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Table 1. Brief Timeline of Methodist Hospital (New Orleans, LA) Activities Before, During, and After Hurricane Katrina in August–September 2005.

Date	Activities
Friday/Saturday, August 26–27, 2005	• Secure home, move furniture, cars, etc to higher ground • Get valuable and important papers • Arrange for evacuation of family and pets • Gather outdoor furniture, generators • Obtain food, cash, portable battery TV/radio • Fill car with gas
Sunday, August 28, 2005	• “Hunker down” at hospital • Emergency surgery performed at 9 PM
Monday, August 29, 2005	• Last surgery in hospital’s operating room • Lost power around 7:47 AM in old tower • Flooding begins about 10 AM with 4.5 feet of water in lobby • Cafeteria, pharmacy, laboratory, radiology, ER, HIM, MIS, and storeroom on first floor flooded • All meals after breakfast prepared on the fourth, fifth, and sixth floors and delivered • Emergency abdominal surgery performed by chief of surgery at bedside in intensive care unit with equipment from darkened OR and radiology—flashlights used to enhance natural lights from windows • Remaining East Tower generator out of fuel around 9 PM • Ventilated patients “bagged” by rotating teams of 3 for approximately 12 hours
Tuesday, August 30, 2005	• Difficulties with communications • Local media make no mention of hospital as seen on battery-powered TV • No contact from outside agencies • Generator restarted with limited fuel supply • Concerns raised by medical staff about mechanically ventilated, dialysis, newborn, and pregnant patients
Wednesday, August 31, 2005	• Concerns over food and water supplies • 170 patients, 760 people total, with some who “swam” or waded to hospital • Began serving 2 meals/day using perishables and soup • Increasing heat up to 100°F inside accompanied by thirst and exhaustion • No evidence of rescue/evacuation until late afternoon—intermittent • Patients evacuated without family members • Unable to communicate with helicopters before landing • No knowledge of where patients will be evacuated to • Nonambulatory patients transported to roof from floors (4+ flights of stairs) • Began water rationing; additional water retrieved from office building • Urgent call placed by chief of staff and CMO to family in Atlanta and message left with CBS affiliate
Thursday, September 1, 2005	• Air evacuation efforts intensify throughout the day • Increased restlessness among visitors and family members • Nonmedical staff assist in patient transfer, etc as volunteers • Total evacuation anticipated by Saturday morning • 2 meals/day and water rationing continues • Difficulties with no working toilets and no ability to bathe persist
Friday, September 2, 2005	• Helicopters landing 2 at a time and waiting in line to complete total evacuation of hospital • Supplies begin to be delivered by the incoming helicopters of all types • Final evacuation of CEO, COO, CMO, and chief engineer accomplished around 2 PM

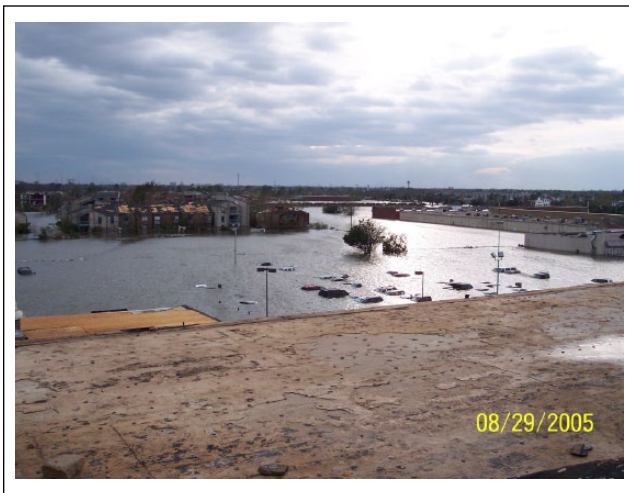
CEO, chief executive officer; COO, chief operation officer; CMO, chief medical officer; ER, emergency room; HIS, health information services; MIS, management information systems; OR, operating room.

Contrary to previously agreed upon (following Hurricane George in 1998) citywide plans for dealing with hurricanes according to intensity (Table 2), no anticipatory evacuation

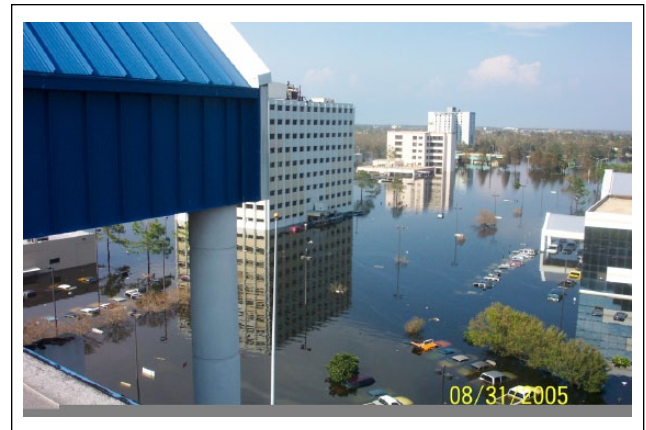
order was given in 2005. On Sunday, August 28, 2005, around 9:30 AM and less than 24 hours before the expected landfall of Hurricane Katrina, the mayor of New Orleans announced the

Table 2. New Orleans Hurricane Plan and Hospital Actions Established Around 1999 Following Hurricane George in 1998.

Category	Action
1	Hospital follows hurricane preparedness plans.
2	City shelters opened. Hospital follows hurricane preparedness plans.
3 (fast moving)	“Special needs” shelters opened. Hospital follows existing hurricane preparedness plan. Citywide evacuation unlikely.
3 (slow moving)	Precautionary evacuation order issued when storm is projected to make landfall within 100 miles of New Orleans and within 72 hours. Hospital begins evacuation preparation.
4	Evacuation of special needs persons announced 8–12 hours following precautionary announcement.
5	General evacuation directive given when storm landfall is within 48 hours or less. Hospital evacuation begins immediately.

**Figure 1.** Methodist Hospital—view from fourth floor patio/roof. Back parking lot facing west-northwest toward downtown New Orleans and Lake Pontchartrain (right). This is also the area where an 11-foot alligator was observed having a leisurely swim later in the week.

mandatory evacuation of the city with the exclusion of hospitals and nursing homes, negating any chance to evacuate Methodist Hospital. Following landfall on the early morning of Monday, August 29, 2005, the hospital had approximately 760 individuals under its leaky roofs and between its imploded windows. Approximately 170 patients were part of the group that also included 19 physicians, hospital staff and some of their families, and patients' families. In addition, the hospital housed a cadre of others who took refuge in the hospital before and after flooding, which resulted in the hospital becoming an

**Figure 2.** Methodist Hospital. View from sixth-floor boardroom balcony facing east. Note submerged cars with open trunks opened by rising pressure.

island surrounded by 4.5 feet of water (Figures 1–2). The latter group was affectionately dubbed “the swim team.”

By 9:30 AM on August 29, long before the major levee break inundated most of the city of New Orleans, the hospital, located in a very low area of eastern New Orleans, began flooding from overtopping and some levee breaches. Before noon on August 29, the old tower had lost power and the backup ground floor generator was under water, transforming many sections of the hospital into darkened caverns and hallways. As the flooding reached 4.5 feet of water, we learned that the East Tower generator, while still functional, was to run out of fuel in 12–24 hours since the pump necessary to refuel it from the storage tank was also under water. On several occasions, with only sporadic communications possible since landlines were out and cell towers had toppled, we received information that more supplies, including a 500-gallon tank of fuel, were on the way. Unfortunately, none of the promised supplies arrived due to redirection, confiscation by unknown individuals to this date.

The 19 medical staff members, led by our chief of staff, medical director of critical care, other members of the executive committee, and the chief medical officer, provided communications, coordination, and continuity of care during the entire period. The medical director of critical care and colleagues assessed patients' needs, particularly in the intensive care unit (ICU), to determine alternatives or safe discontinuance of certain aspects of monitoring and therapies to ease the burdens on patients and staff while decreasing dependency on power, water, and medical gases. She also coordinated the patient evacuations when they began late Wednesday.

PN and enteral nutrition (EN) were gradually discontinued due to identified alternatives, as pump batteries could not be recharged. In some instances, intravenous (IV) fluids were administered via gravity and drop-count methodology. Oral liquids were provided, albeit with the acceptance of potential for intolerance.

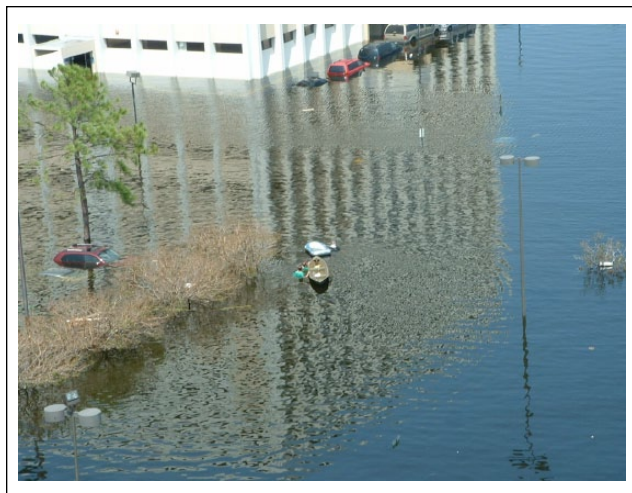


Figure 3. “Water, water everywhere nor any drop to drink.” (Samuel Taylor Coleridge, “The Rime of the Ancient Mariner”) Heroic journey of engineering department representatives through snake-infested waters from hospital to office building with hopes of retrieving bottled water on August 31, 2005.

By Wednesday, August 31, no one was aware of how long food and water supplies would be needed, so the food and nutrition team were planning for supplies to last up to 10 days. Several members of our engineering department braved the chest-deep, water moccasin-infested waters through the parking lot to the Medical Center of East New Orleans (MCENO) office building (Figure 3). They were able to enter the various offices with a pass key and retrieved twenty 5-gallon bottles of water usually present in physician offices’ water dispenser/coolers to ensure that all water supplies would last 10 days as well. These were transported via a small boat and stored in the command center/administration office, which became the site of water rationing amid temperatures above 100°F and humidity (Figure 4). While at MCENO, they discovered a very elderly woman in the lobby. She had evidently been there for days alone. She was in surprisingly good condition and was very complimentary of her ration of canned vegetable soup.

The development of enteric bacterial infection was a grave concern since toilets were not functioning. All available sanitizers and antiseptics were distributed in a controlled fashion. The first evacuation via helicopters began sporadically late Wednesday and continued until 2 PM on Friday, September 2.

Nutrition Support During Katrina

Methodist’s NST was in existence from 1978–2005. Throughout the years, it met various challenges and threats to its existence but always concentrated on function rather than form. It followed most of the standards and practices established by the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.). A policy and procedure manual was gradually developed and revised throughout the years but with



Figure 4. Water rationing from “aqua center,” administration office. Carol Beck-McCullough, chief nursing officer, on left and staff member receiving water jug modeling “Katrina Cut” scrubs, with Judy Fern providing the water allocations..

no or minimal reference to disaster preparedness. However, the component hospital departments had their respective disaster preparedness plans, which they not only followed but also modified in anticipation of Katrina.

Food and Nutrition Services Department

The director of the food and nutrition services department, who had joined the Methodist Hospital family only 2 months prior, initiated preparations starting on Thursday, August 25, by adding the additional emergency order called for in the plan to the usual Friday delivery. Unfortunately, not all of the particular combined delivery items arrived, and after consulting with his regional manager, he sought another supplier who could fill the order on Saturday but could not provide delivery.

He arrived at the hospital with the usual anticipated 3–4 days of clothing and toiletries early Saturday morning. He was greeted with the news that 2 members of his hurricane team were not going to stay, reducing the group to 5 employees. Working as a cohesive team, they developed a cooking plan and a list of the needed supplies. They rented one of the remaining 26-foot U-Haul trucks and filled it with the supplies on the list and, as they say in N’awlins, “lagniappe”—a little something extra. After unloading, they proceeded to a wholesale club since the club had called offering their perishable items. While at the store, they also purchased a 5-foot grill and 4 propane gas tanks. He and the baker remained at the hospital while the rest of the team was encouraged to go home, make whatever arrangements they needed, and return the next day with their personal belongings. On Sunday afternoon, while the baker continued to bake, the food and nutrition services director and other team members began transporting supplies and equipment to 3 secure locations in the upper floors to stage food and supplies for later in the week.

On Sunday, August 28, the regular patient trays were delivered by the skeleton crew, but a modified menu was offered in

the cafeteria. Afterward, attention was turned to modifying the patient menu and consideration was given to the implementation of the patient disaster menu since the team was not sure if the next food/supply delivery would arrive as scheduled on Tuesday, August 30. The department disaster plan was reviewed and implemented. Cooking all possible items continued with cooking, slicing some cooked meats, and freezing whole 12-pound hams, turkeys, and cooked roast beef to maximize their use in anticipation of loss of power. They were frozen solid and placed in portable insulated ice cream freezers. This technique maintained the integrity of these cooked meats as needed and even through the departure on Friday.

All racks, tables, and so forth on wheels were moved to the 3 previously designated areas on higher floors. All breakfast and dessert items were stored on the fourth floor, while the fifth-floor location held the lunch and dinner items. The sixth-floor location contained dry and paper goods as well as freezers and refrigerators. The team continued to work throughout the night completing the preparation for what was anticipated to be a very deadly hurricane.

On Monday, August 29, after a rather routine start, a member of the team incurred a fall and was unable to walk, reducing the entire staff to 7. The flooding began as lunch was being prepared and very quickly necessitated abandoning the cafeteria, kitchen, and store areas. Hence, the team walked upstairs to the temporary food locations that were created on Sunday as the elevators stopped working and they were unable to complete serving hot meals.

After regrouping and resettling, the focus was on patients with special diets, followed by those on regular diets, and then on how to provide meals to the almost 800 additional individuals stranded in "Methodist Island." Concerns regarding the sustainability of supplies beyond a 3- to 4-day window, particularly water, resulted in further refinement of previous predictive plans. Due to logistics and to provide better control of provisions and meals, a system of "floor captains" who would distribute meals was substituted to reduce potential abuse with the "open cafeteria" style.

The conditions, as outlined in Table 1, continued to deteriorate with little if any power, extreme heat and humidity, inoperative toilets, no source of water, and little if any communications to the outside world. On Monday, the cold disaster menu option was implemented for the lunch and dinner meals. On Tuesday, the previously acquired propane grill was commissioned into active duty and provided morning coffee and a waterfront view since it had been located on the fourth-floor patio outside the chapel. Later in the day, the grill was pivotal in the ability to offer soup to the masses, albeit in 100°F inside temperatures, but the team subscribed to the adage that "Halitosis is better than no breath at all." It was well received by all constituencies despite previous concerns. Innovative solutions for dealing with the heat and humidity included frequent visits to the patios, cutting the short sleeves and below-knee sections of scrubs (also known as, Katrina

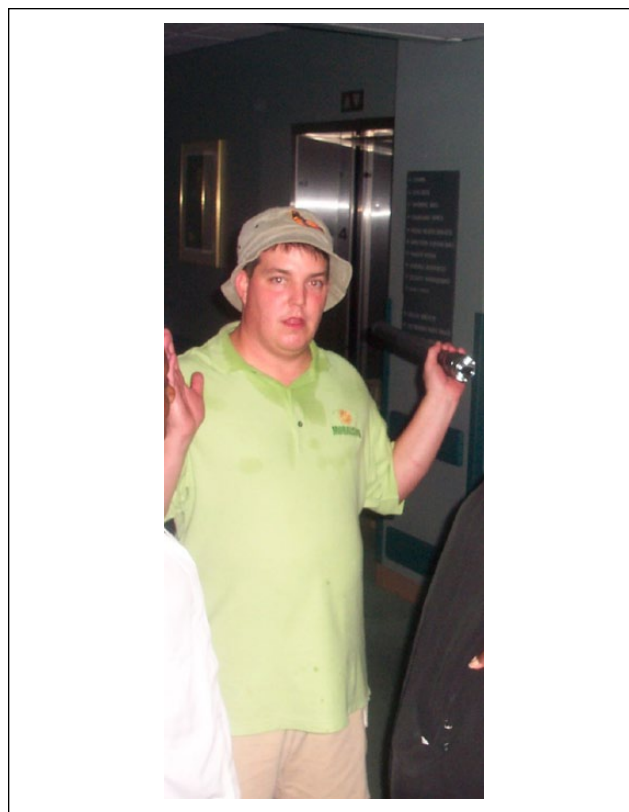


Figure 5. Jeff Tonini, food and nutrition services director, with flashlight in hand conferring with members of the skeleton crew.

Cut), and sleeping on the roof (chief medical officer and the director of food and nutrition services).

When asked to provide his Katrina perspective for this article, the food and nutrition services director stated,

I only knew most of these folks for about 2 months of my life, but I have shared a very great life experience with them and hope that my being with them made their experience better. (Jeff Tonini, Figure 5)

The regional manager noted that despite the absence of a registered dietitian (RD), a consideration for future planning, there was a 7- to 14-day supply of tube feedings and supplements. The diet manual was in place and accessible even in the absence of a computer system. The food and nutrition services disaster plan was in place with preemptive food ordering and moving to safe levels in the hospital, not on the bottom or top floor. Substantial caloric levels were maintained for patients and staff to care for patients.

One of the authors' (AB) patients was in the ICU receiving PN due to an ileal fistula. Her first experience with Katrina was when she was moved away from the window in her ICU room in the early morning of August 29, when the window implosions occurred. After the decision was made

to discontinue EN and PN, she was provided oral liquids, including soup prepared on the outside propane grill, accepting the fact that her fistula output would increase. Later in the week, as she was about to be airlifted to places unknown with her medical record strapped to her chest, she was given 2 small halves of sandwiches to take with her, and she provided a gentle smile while thanking us.

Pharmacy Department

Paralleling proactive preparations in the nutrition department, the pharmacy held a departmental meeting on Friday, August 26, with designation of essential personnel to report on Sunday if the predictive path of Katrina continued. The pharmacy director reviewed the previously established hurricane order, which usually includes 20% of items purchased and emergency-type medications such as tetanus injections. The order placed on Friday was delivered on Saturday. On Sunday afternoon, following a planning meeting with the hospital leadership and the medical staff representatives, our visionary pharmacy director together with her relatively inexperienced team proceeded to move the department and supplies to higher ground in anticipation of flooding. She commandeered the sixth-floor medical staff services office and set it up for storage and dispensing medications, IV fluids, and PN as well as securing narcotics. After anticipating a 3- to 4-day hurricane plan that ensured the continuation of current IV fluids and the nutrition program, the patient profiles were assessed. The pharmacy department personnel prepared the usual PN solutions with additives as ordered for Sunday afternoon and 3 days of base solutions for each patient with a few extra in the event of new starts, assuming the worst-case scenario of no access to IV admixture hoods and auto mix processors. The entire IV inventory was moved since all were stored on rolling racks. Ready-to-hang enteral feedings along with a few cans were stocked and kept in the refrigerator that was part of the pharmacy's new location.

The clinical pharmacist assumed the function of monitoring laboratory tests and consulting with physicians regarding modifications of additives and so forth in the absence of the NST. Once power was lost or limited, only minimal if any laboratory studies were used, which coincided with the decrease in use of pumps, gravity feeds, and the identification of alternatives. After Wednesday, neither enteral nor parenteral feedings were provided. The pharmacy director noted,

This was the first time I did not have any of my seasoned pharmacists scheduled as essential but the group I had turned out to be one of the bravest I have ever worked with during a hurricane. (Paulette Moten-Bickham, Figure 6)

Nursing Department

Nutrition support was not top-of-mind concern as we prepared for Katrina; nor had it been for any of the dozen or so



Figure 6. Paulette Moten-Bickham, pharmacy director with staff in makeshift pharmacy.

hurricanes we had experienced in the past. This one, however, was to be different, very different. (Carol Beck-McCullough)

Essential personnel were contacted on Sunday and requested to report to the hospital between 10 AM and 2 PM. As many patients as possible were discharged. The remaining patients were consolidated to accommodate the reduced staff. Rooms were assigned to hospital and medical staff. Sleeping arrangements and provisions were made for a children's area and staff to support it. All supplies, including food and medications, had been checked at the beginning of the watch period and deemed adequate.

Shortly after landfall, another area that required prompt translocation was the emergency department, which was quickly moved to the second and later the fourth floor. Batteries



Figure 7. Dr Janine Parker, medical director of the intensive care unit in Methodist's 29-bed unit.

in equipment were short-lived, including IV and enteral pumps as well as ventilators. Many pumps were left to run on gravity, and some ventilated patients were bagged for 12 hours by using rotating teams of 3 individuals. Some engineering and emergency room staff left the building repeatedly through the flood waters, scavenging the neighborhood for supplies and especially diesel fuel, which provided the minimal energy to support the ventilators and some lights in our 29-bed ICU (Figure 7).

The frail elderly and infants were affected the worst by the heat and humidity, leading to dehydration. Patients on dialysis had neither power nor water for dialysis since early Sunday. Formulas and glucose water from the nursery were distributed to the children. Water was distributed twice per day. On Wednesday, when frozen turkey rolls thawed, they were sliced by 2 volunteers and distributed along with white bread to everyone, including patients on special diets. By Thursday, meals consisted of one cup of fruit cocktail around 10 AM and a cup of canned soup around 6 PM.

Thursday, 2 of us began going through all of the offices in the building. We searched the desks and closet for batteries, flashlights, and most importantly any food or juices. Finding a pack of cookies or a bag of candy was a "Eureka" moment. (Carol Beck-McCullough)

Transdisciplinarity

The work that the core NST members, who were not at the hospital, had previously performed in educating and raising awareness of nutrition support in hospital and medical staff alike was reflected in the actions of those who remained in the hospital during Katrina. One of the precepts embraced by the Methodist NST was that of transdisciplinarity. The team

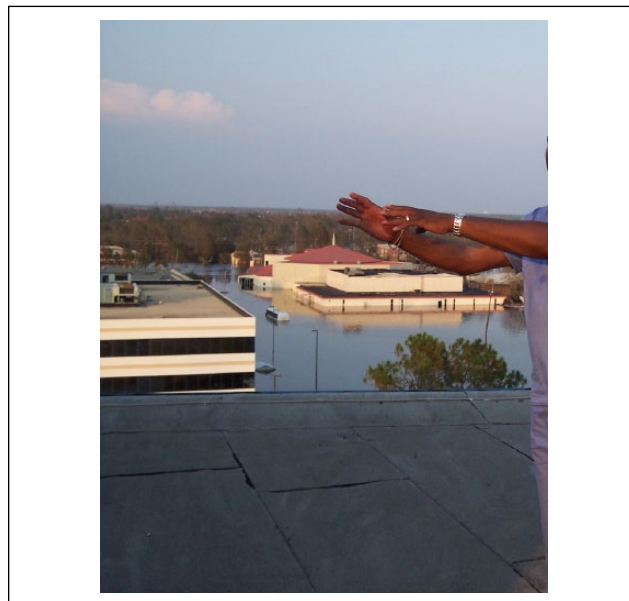


Figure 8. Behavioral health nurse's arms help direct helicopter roof landing. Note surrounding flooded area.

was administratively developed along the core disciplines in a multidisciplinary fashion. During the 1980s and 1990s, it was interdisciplinary from an operational perspective. It had evolved to a transdisciplinary type as more focus was placed on function rather than form and in response to budgetary and external changes in the healthcare system.

Transdisciplinarity allows the performance of a particular function to be carried out by the most qualified or available individual in the particular institution at the time. Individual discipline lines are blurred, although each participates in the collective determination of the functions. Transdisciplinarity efforts during Katrina were evident not only in the realm of nutrition support and hydration but also in the other functions carried out. A behavioral health nurse acting as an air traffic controller for the evacuating helicopters (Figure 8), an anesthesiologist assisting with the transfer of a postbariatric surgery patient up 4 flights of narrow stairs on a bed sheet to reach the roof (Figure 9), the chief of surgery sweeping the roof landing pad and surrounding the waiting areas (Figure 10) for patients' evacuation (Figures 11–12), and the variety of family members who volunteered to perform various tasks are testament to the transdisciplinarity exhibited.

Katrina brought out the best and worst of humanity. At Methodist Hospital, the overwhelming experience was one that brought out the best, particularly from our dedicated hospital and medical staff.

Lessons Learned and Recommendations

Table 3 summarizes recommendations for hospitals and staff regarding disaster preparedness according to the rule of "Ps."



Figure 9. Hospital staff, including an anesthesiologist, lift a patient up flights of stairs.



Figure 10. Dr. Jan McClanahan, chief of surgery, pitches in to help remove debris from the roof after the storm, demonstrating transdisciplinarity at work.

Specific to NSTs, the following are recommended:

1. Include disaster preparedness measures in the NST policy and procedure manual and/or develop a stand-alone policy.



Figure 11. An aircraft sent to the hospital to evacuate patients, staff, and others stranded at the hospital.



Figure 12. Patients heading toward a helicopter for evacuation from the devastation caused by Hurricane Katrina.

- a. People: Who is considered essential and required to be in house during disaster?
- b. Places:
 - i. Where are policy and procedures stored?
 - ii. Is there an updated roster of all departmental employees?
 - iii. Is the medical staff roster accessible?
- c. Procedures: Make sure staff know what to do when and if a disaster occurs.
- d. Preparation:
 - i. Days—Preparation should begin when anticipated landfall is within 72 hours.
 - ii. Timeline—A timeline should include what to do when before, during, and after a disaster and updated accordingly.

Table 3. Considerations—Rule of Ps for Disaster Preparedness.

Plan—emergency/disaster preparedness reviewed at least annually
Policy and procedures—electronic and paper copy updated
Places—Available secure storage. Sleeping accommodations. Alternative settings
People—Determining essential staff on a regular basis
Practice—Frequent drills
Protocols—Checklists, timelines to follow, approved by medical executive committee
Prescriptions—Fill them ahead of time if possible
Petroleum—Fill gas tank. Also ensure diesel fuel availability
Potable water—Identify sources and storage
Portable generators—Check periodically. Locate in highest elevation possible.
Provisions—3–7 days: water, food, sanitizers, alternatives to toilets
Pressure—Faucets, toilets, higher floors, elevations
Placement—Discharge as many patients as possible. Know where your family is going
Phones, walkietalkies, ham radios, satellite phones—Communication is key
Power—Alternative sources
Process—Designate roles/function (eg, incident commander). Transdisciplinary approach.
Produce—Perishable items
Products—Review hurricane list and contact distributors/vendors
Projects—Before and after disaster
Proactive—Anticipate worst-case scenario and execute early
Petition—From governmental agencies, charitable organizations, corporate office, not-for-profit entities
Pistols and other weapons—Protection from looting, preferably used by law enforcement individuals
Posts—On social media
Pictures—Documentation of events. Assessment of damage. Capture innovations
Pedal—Have available bicycles if no gas or some roads impassable
Pocket money—Cash is king when banks are closed and ATM machines lose power
Professionals—Ensure representation from all disciplines if possible
Papers—Personal IDs, driver licenses, birth certificate, military discharge papers, passport, deeds, mortgages, wills, insurance policies, etc
Public—Communicate that the hospital is not a good shelter
Providers—Designate key physicians and mid-levels to coordinate efforts
Purell—Sanitizers, soap. Overestimate needed supplies. Avoid using hand rails in stairs
Partners—Know where associates will be located. Have contact information available electronically and on paper
Predictions—Battery-powered radio/TV with weather band for updates
Payments—Be current with creditors and contact them as soon as possible if the aftermath of the hurricane will lead to missed or delayed payments
PT boats, pontoons, and pirogues—Able to maneuver in case of flooding
Personnel—Determination of who is essential in each department. Discourage relatives of staff to come to hospital
Pets—Have contingency plan ahead of time
Patrols—Frequent rounding and monitoring. MBWA—management by walking around
Police—Invite them to join you during hurricane. Provide space for them to establish a substation
Planes/helicopters/ambulances—Have contracts in place with entities outside the strike zone in place
Plumbing—Water for washing hands, flushing toilets
Protective gear—In case of toxic spill or leaked oil and fuel, including diesel in flood waters, which can be irritating
Partitions—Creative design to increase available space and provide privacy
Priorities—Triage list updated to designate order of evacuation
Preemptive—Move according to perceived needs, ahead of official mandates or announcements
Pumps—For intravenous, enteral, and parenteral feedings. Additional batteries, rechargers
Primer—To restart generator
Pen lights—Use sparingly. Ensure overabundance
Prepare—Home, family, practice, etc
Pray—Often, individually, and collectively

- iii. Adequate handoffs—Communication should occur from shift to shift, discipline to discipline, team member to team member, and essential to nonessential personnel.
- iv. Drills—There should be disaster drills at least quarterly to determine process, locations, and so on.
- e. Products:
 - i. What can be provided in the absence of power, potable water, mixing hood, and so forth?
 - ii. Are there ready-to-hang formulas and alternatives to refrigerators?
 - iii. Are there satellite phones and walkie-talkies with designated channels?
 - iv. Can solar-powered IV/enteral pumps, batteries, and rechargers be developed?
- f. Partner with:
 - i. Director of nutrition service regarding regular food supplies, supplements, snacks, and so on
 - ii. Other disciplines
 - iii. Vendors/suppliers regarding routine and emergency supplies
 - iv. Hospital emergency/disaster preparedness committee
 - v. An emergency network with other institutions with nutrition support teams
 - vi. A.S.P.E.N., who should consider an emergency preparedness task force and establish a centralized phone number and website for emergent situations to assist with preparations and networking
 - vii. Intersociety, industry, governmental agencies, and so forth similar to KatrinaHealth⁷ for rapid response for individuals in need
- g. Personal:
 - i. Arrange for safe family/pet evacuation.

- ii. Establish a central communication and evacuation site for all family members outside the projected strike zone.
- iii. Develop a diary not only for historical purposes but also to facilitate claims, reimbursement, and so on.

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