North Carolina’s Disaster Response to Hurricane Katrina:  
The State Medical Assistance Teams

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In the wake of Hurricane Katrina, the State of North Carolina responded to the disaster by deploying the State Medical Assistance Team (SMAT) to Waveland, MS, a Gulf town ravaged by the hurricane. The author of this article, Michele Rudisill, RN, BSN, helped lead the first deployment of the SMAT Field Hospital in Waveland. Her story describes the successful pre-disaster coordination between North Carolina’s various medical response organizations that allowed the team to quickly deploy to the region and almost immediately begin providing critical medical services to the surrounding population. This response was so effective that the SMAT effort is now recognized nationally as a model system for disaster response.

In the initial days following Hurricane Katrina, the State’s emergency officials made the governments of Louisiana and Mississippi aware of assets in North Carolina that could be available to them through the Emergency Management Assistance Compact (EMAC) agreement. The EMAC agreement was signed with Mississippi, and on September 2, 2005 the State Medical Assistance Team (SMAT) convoy left Charlotte with 98 personnel and 39 vehicles. The eventual destination was Waveland, Mississippi, a small town on the Gulf Coast, with a pre-Katrina population of approximately 7,000. It is located about 60 miles northeast of New Orleans.

The convoy arrived at the site on September 4. The area surrounding the town was totally devastated by Hurricane Katrina. There was no infrastructure left. There was no electricity, no communications, and no clean water available for drinking or washing. There was only limited local fire and police protection. The availability of fuel for transportation and generators was almost non-existent. Along the beach road, there were only foundations left from multi-million dollar homes. Neighborhoods a half-mile back from the beach were demolished; houses were completely destroyed and reduced to rubble. Ironically, all that remained of Waveland City Hall was a sign that read “in appreciation for those who helped rebuild after Hurricane Camille.”

The Mission

The SMAT mission was to set up a field hospital with trauma services to serve a six county area. The local hospital, Hancock Medical Center, had been flooded during the storm. Much of the facility was inoperable, as all of the patient care areas and critical services were...
located on the first floor. It is estimated that the storm surge was approximately 30 feet in some areas of the town. Patients at Hancock Medical Center were originally moved to the second floor and the remaining patients were evacuated from the hospital the same day as our arrival. Given the mission, the question became how to set up a hospital in an area that had been totally devastated. Prior to arrival, the SMAT command staff met with officials at the local Emergency Operations Center (EOC) in order to determine possible setup locations for the field hospital. The site that was chosen was a strip mall anchored by a K-Mart store. The strip mall itself sustained major wind and water damage; some evidence suggested that the storm surge had gone over the building. This strip mall was located at the intersection of two major highways in town and had become a tent city for about 70 displaced families. Choosing a well known, easily accessible location was important to the success of the mission.

Background

While many governmental shortcomings and failures in the disaster response to Hurricane Katrina have been widely reported, North Carolina’s response provides an example of how planning and preparedness for a disaster can lead to a successful outcome. The response was a coordinated effort of the North Carolina Office of Emergency Medical Services, North Carolina Emergency Management, the North Carolina Trauma System, and North Carolina Public Health.

The building blocks of North Carolina’s disaster response lie within its trauma system, centered on the State’s eight Regional Advisory Committees (RACs). Utilizing Level I or Level II trauma centers within the respective regions, these RACs coordinate trauma care and disaster planning throughout the State, with an emphasis on interagency collaboration. Much of this vision for public health disaster response was developed following 9/11, when new sources of federal funding were funneled to the State by the Health Resources and Services Administration (HRSA) in the U.S. Department of Health and Human Services (HHS). While originally earmarked for bioterrorism training and preparedness, state officials expanded this original purpose to encompass a program with significant applications to natural disasters like

floods and hurricanes. The concept of the State Medical Response System and the elements of the State Medical Assistance Teams (SMAT) were born. Overseen by the NC Office of Emergency Medical Services (NCOEMS), SMAT teams were designed for an in-state response to disasters based on a regional model embedded within the RACs. Each RAC has its own SMAT II team consisting of health care professionals and support personnel from the individual organizations that make up the RAC and was led by a disaster preparedness specialist.

The MidCarolina Trauma RAC, along with the other RACs within the state, have developed a strategic plan to address many of the possible challenges in the event of a disaster, including:

- Injury prevention in the region
- Communications and access to the system
- Trauma protocols and policies for pre-hospital and inter-hospital transfer

Prior to Hurricane Katrina, the SMAT II teams within the state had been used in limited situations and drills regionally, but they had never been deployed collectively. Following Katrina, the RACs partnered with the Carolina Medical Center in Charlotte to deploy the NC SMAT II Field Hospital to the Gulf area. This field hospital combined a federally funded, 16-bed mobile hospital with the existing SMAT teams. Once these collaboratively planned tools of public health were deployed to Waveland, the team immediately began to address the problems on the ground.

Due to the thinking outlined in the strategic plan, many of the initial logistical challenges were met by the trauma team. This freed members of the deployment to act creatively when unforeseen challenges arose; preparation was essential for on-site innovation and resourcefulness.

On the Ground, Setting Up

Planning was key during the setup phase. Having personnel with multiple abilities to be able to fill multiple roles was very important. An example of this was a paramedic that also had electrician experience. He proved invaluable when he accessed the wiring of the parking lot lights. By connecting the lights to a generator, the site had illumination, so set-up work could continue throughout the night.

Safety

Safety was one of the first issues addressed. The team had traveled with members of the Charlotte SWAT team, and they provided security forces for the field hospital throughout the deployment. During the set-up phase, the SWAT team did a safety assessment of the area. Reconnaissance of the interior and roof of the strip mall was one of the first tasks.

Debris

While the SWAT team was completing the safety assessment, the SMAT team members were busy hand-cleaning debris from the parking lot. There were also vehicles littering the parking lot, apparently landing randomly wherever the flood waters had left them. The command staff located a local tow-truck operator and had the cars pushed to line up end to end. This formed a safe perimeter around what would become the NC SMAT II field hospital.

Site Design

About 12 hours after arrival, the initial set up was completed and the field hospital was open for business. The triage area—comprised of tents to which the patients initially reported—was located at the entrance of the compound. Here, nurses and paramedics obtained vital patient information. A patient’s severity of illness was determined; then, the patient was either directed to a
tented, six-bed acute care area or to an emergency services area for more serious complaints.

**Open for Business**

Once opened for business, the patients began coming. They arrived by foot, on bicycles, and one woman even was pushed by a family member in a shopping cart. Patients also arrived by more conventional means such as ambulances. At this point, the challenges took on a different form.

**Sanitation**

Basic sanitation was a huge issue that was identified soon after opening. There was no clean water in the area for locals to bathe or to wash. The staff set up crude hand-washing stations at the triage area using a mixture of bottled water and Clorox. Each person who came onto the compound had to wash his or her hands and then clean them with alcohol-based hand sanitizer prior to entering the field hospital.

**Transportation**

Like most other hospitals, it was determined that a helicopter landing zone (LZ) was needed on the compound. The LZ was needed to transfer patients in and out of the field hospital, and also for the delivery of supplies. The space was available in the parking lot, but debris again needed to be cleared in order for helicopters to safely land. In addition, there were several parking lot lights in the area that had to be considered. The command staff procured National Guard staff to push down and remove the lamp posts and they also obtained a swamp fanboat. The boat was pulled around the parking lot with the fan running, clearing the parking lot of fine debris. Thanks to this truly creative solution, helicopter landings soon became a common occurrence.

**Staffing and Infrastructure**

As the operation mushroomed on a daily basis—by the fifth day of operation, over 1,000 patients had come to be treated—the compound evolved into a mini-city with its own infrastructure. Both FEMA and the Mississippi Department of Health had also set up in the strip mall parking lot. Throughout the operation of the NC SMAT II field hospital, the command staff continued to maintain open communication lines with the local EOC as well as with the local hospital administration.

To keep the operation at peak efficiency, personnel from North Carolina were rotated approximately every seven days to staff the field hospital. As the hospital evolved and grew, new types of personnel were added to the rosi-
ter. In the second week of operation, a portable Computerized Tomography (CT) scanner was added to the site, so an imaging technologist was added. In addition, mental health professionals, industrial hygienists, epidemiologists, medical records specialists, and database managers arrived to assist with evolving health issues. From this experience, the team learned one of the great lessons of this mission: successful healthcare facilities in post-disaster areas will have staff similar to those found in functional hospitals.

**Exit Strategy**

Once the local Hancock Medical Center reopened with limited services, the team began to formulate an exit strategy. This was accomplished in phases to determine if the local hospital could successfully handle the volume and acuteness seen at the field hospital. The NC SMAT II Field Hospital did not want Hancock Medical Center to be overwhelmed upon its departure. On October 11th, the NC SMAT II Field Hospital became the NC Clinic and reduced its mission to urgent care complaints between the hours of 8 am and 4 pm, while the Med-1 asset began demobilization. On October 20th, the NC Clinic closed, and the convoy began the long journey back to North Carolina.

**Conclusion**

The planning, preparation, and collaboration before the event allowed for public assets to quickly and effectively deploy to the Gulf area. The strength of the pre-existing institutional collaboration allowed SMAT II personnel to immediately step into predetermined roles and adapt with creativity when unusual situations arose. As a result, the statistics from the operation are staggering. In the seven weeks of operation, over 7,500 patients were seen. Although the hospital operated 24 hours per day, the majority of these patients were seen between the hours of 8 am and 8 pm due to a curfew in the area. Over 90 percent of these patients were seen in the acute care area, with less than ten percent needing the critical services of the Med-1 asset. Personnel from hospitals and EMS agencies all across the State participated in this mission. The teamwork that was shown by all staff was exemplary. The response of the North Carolina State Medical Assistance Teams to the Gulf Coast is now seen nationally as a model system for disaster response.

**Resources**

Visit the MidCarolina RAC web site:
http://www.med.unc.edu/nursing/associated/rac/000_midnc.trac.home.htm