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When It Rains, It Pours

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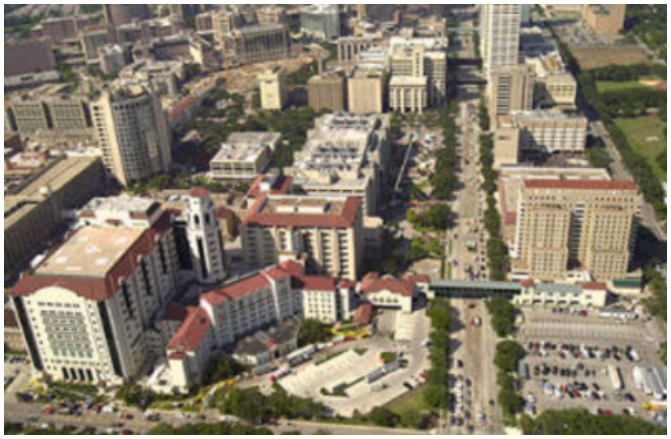
Abstract

When a storm hits and floods the largest Medical center in the world you put in to play all of your disaster plans. Memorial Hermann hospital is one of 2 level I trauma centers in Houston (picture 1).

Figure 1

Picture 1. Memorial Hermann Hospital

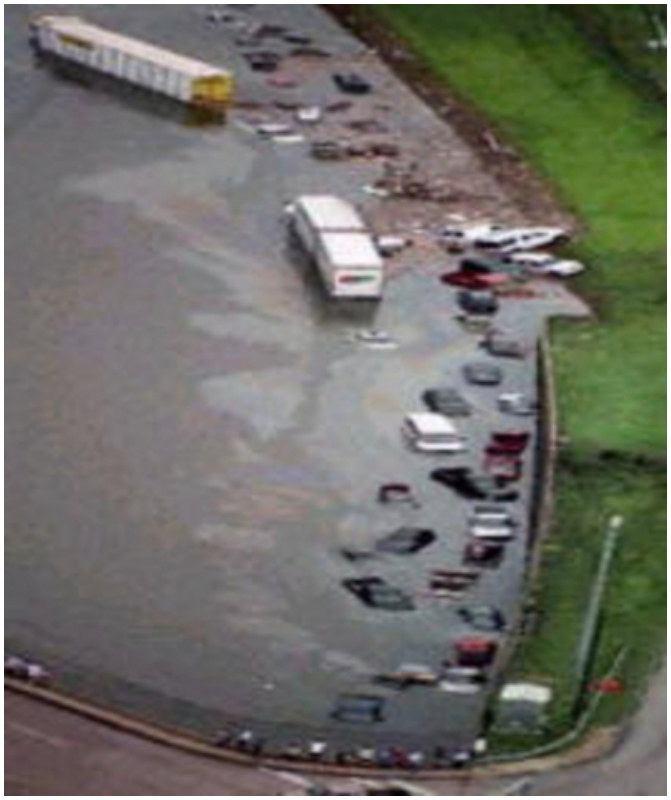


As the rain fell I was watching the devastation on the television. I knew that I had to do what ever it took to get to the hospital. As morning came I began to plot the course of my route to Memorial Hermann. With the assistance of my significant other and Dr Joseph Nates I was able to maneuver thru the flooded streets (pictures 2, 3).

Figure 2

Picture 2, 3. Flooded streets

Figure 3



When I arrived to a dark flooded hospital it was difficult to believe what I was seeing, it was something out of a movie. The floodwaters had destroyed everything on the ground floor of Jones and the Pavilion. Chairs, plants, debris, and even parts of the piano were floating in the murky water. I went to the Neuro Trauma Intensive Care Unit and the Epilepsy Monitoring Unit to assess the situation. Both units had implemented the correct emergency procedures and were doing amazingly well. The biggest complaint was lack of water and bathroom facilities. Food had been brought in and staff were getting relief from the new staff members that were able to make it in to the hospital. Once I knew that the staff and patients were safe I went to the command center, which was located in the Emergency Center. A group of hospital administrators, doctors and directors gathered together to assign duties. What needed to be done was a list of all personnel that was in the hospital, all of the patients, diagnosis and Doctors, what patients were the most critical and need of immediate transportation. Another aspect to investigate was what was needed for drugs, blood and medical supplies since the entire Laboratory, Central Supply and Pharmacy had flooded (pictures 4 to 7).

Figure 4

Pictures 4-7. Flooded services

Figure 5

Figure 6

Figure 7

Water and food were already sent for and portable bathroom facilities were in route (picture 8).

Figure 8

I was then given the task along with Dr Christine Cocanour to triage patients out of the hospital to other available facilities. What we needed to take into consideration was bed availability, and hospital accessibility since most of Houston was flooded. Once we had a list of beds in the area we activated our evacuation plan. At that point we thought that we would have the power restored quickly and were planning to move the most critical patients out first. We compiled our priority list of all of the ICU patients along with their condition and proceed to arrange transfers. We needed to consider Medical and Nursing coverage for these patients once they were transferred. The hospital Medical Director quickly arranged for emergency medical privileges at the receiving hospitals. The nurses that accompanied the patients would take care of the patient and it was agreed that their paperwork would be completed at a later date. We had to look at all available transportation. Ground ambulance transportation was limited due to the excessive flooding and the need for emergency rescue out in the city. Lifeflight was available but we would have to land on the street since the helipad on the top of the building was not an option (picture 9-11).

Figure 9

Pictures 9-11. Ambulances and rescue helicopters

Figure 10

Figure 11

Arrangements were quickly made with the city of Houston to allow the helicopter to land on the street. We continued to be faced with being able to provide the same level of care to our critically ill patients that were in the building and being transferred. Since we had implemented the Disaster emergency call tree. Rested staff came in to relieve the staff that had been working and to travel or care for patients. We were limited to the number of staff that did arrive due to the nature of the flooding. At first we slowly and systematically moved patients. As the process continued and time passed by the gravity of our situation came to light. The hospital would have to be totally evacuated. We would have to have every adult and pediatric patient transferred or discharged out of the hospital. We regrouped and developed a plan that guaranteed the safety of staff and patients. By this time we were receiving manpower assistance from our hospital, sister facilities within the Memorial Hermann Healthcare System and the community. We retrieved all available backboards from the Emergency Center, patient floors and arriving ambulances. We lined up teams of men and women that along with their backboard waited for their patient evacuation assignment (picture 12-13).

Figure 12

Pictures 12-13. Emergency Department (ED)

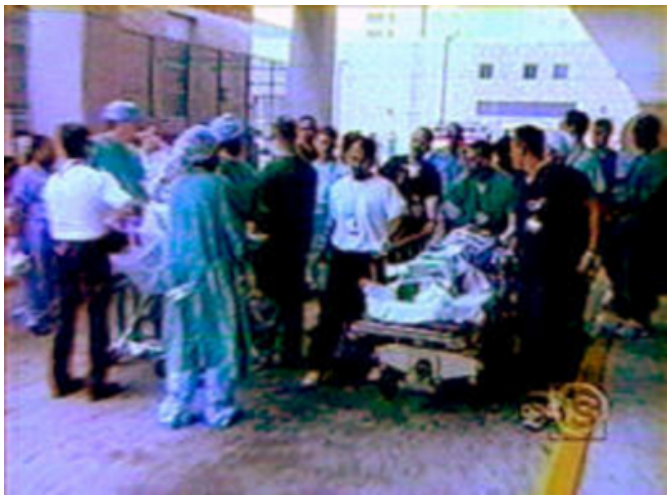
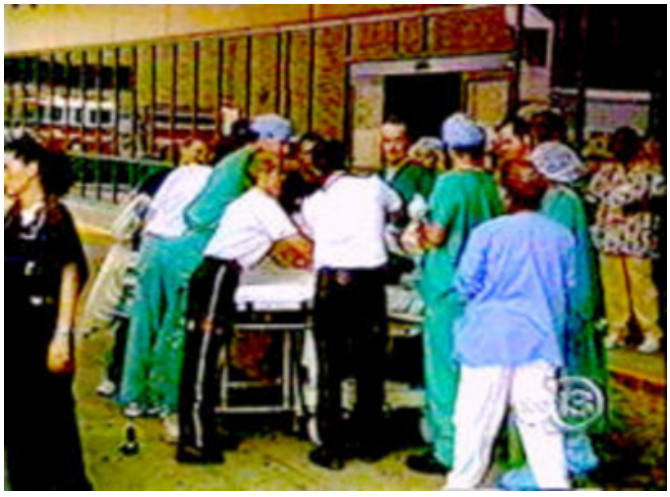


Figure 13



Patients began to arrive in the triage area under their own power or carried on backboards. We had stretchers available to place the patients on as soon as they arrived on ground level. Something that made patient marking easier was our sticker system. This system proved to be invaluable during our evacuation since we could place a patient sticker on everything that belonged to them. This cut down on lost items. The belongings may have been left behind on a rare occasion but we knew who owned them. Our hospital had patients in 4 separate buildings and as high as 10 floors. One of our groups of volunteers were the boy scouts who were very eager to assist with what ever was needed. As the movement of the patients increased it became very evident that we needed to make sure that we knew where every patient was at all times. It was also important that patients went with their belongings. Be it still in the units, in the triage area, placed and awaiting transportation or in route to

the receiving hospital. This process has to have limited people in charge. Directions must come from the Command person only. This avoids errors and patients placed in an incorrect environment. Dr Cocanour and myself maintained control over the entire triage process (picture 14).

Figure 14

Picture 14. Janine Mazabob in ED

We had to be aware at all times of what was going on with the patients. Pediatrics posed a unique problem since there are limited pedi beds within Houston. We transferred the pedi patients to hospitals were a make shift Pedi unit could be opened (picture 15).

Figure 15

Picture 15. Pedi evacuation

The day quickly turned to night and the transfer process slowed down. We had saturated the community with our transfers and no additional patients could be moved. This downtime was used to get refreshed and to reevaluate our evacuation plan. All remaining patients continued to be cared for by staff. As morning broke we began our triage process where we had left off. This time Black Hawk helicopters assisted us in transporting patients (pictures 16, 17).

Figure 16

Pictures 16, 17. Black Hawks

Figure 17

Having these helicopters available improved our process of moving more patients out. As long as they were going to the same facility transportation went much quicker. More manpower arrived and we also had additional ambulances for ground transportation. Finally on Sunday afternoon all patients were safely evacuated (picture 18).

Figure 18

Picture 18. Last patient is being evacuated

LESSONS TO BE LEARNED

A natural disaster can come in many different events that it would impossible to plan. The basic preparation never changes and should be the model to build on when faced with a disaster.

References

Author Information

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