This past summer and fall many parts of our country faced significant challenges as a result of the devastation brought on by hurricanes Katrina and Rita. In this edition of the Dispatch we are grateful for the contributions of many of our section members who write in detail about their experiences transporting critically ill neonates and children during and after these storms. These first-hand testimonials should serve as a template in delivering emergent medical care under the most trying conditions. Many of our members were even featured on national news shows describing the events during and after the Katrina and Rita hurricanes. We are so proud of their hard work and heroism.

As another year begins, it is a great pleasure to update you all on the status and activities of our Section. Again, I would like to welcome all our new members and affiliate members to the Section on Transport Medicine (SOTM). We now total over 273 members, including a strong number of affiliate members who represent nursing, respiratory care and EMT/Paramedic transport professionals.

We have a very dedicated, hard-working Executive Committee including Drs Bruce Klein (Washington, DC, Peds ER), Monica Kleinman (Boston, PICU), Calvin Lowe (Los Angeles, Peds ER), Sherrie Hauft (St. Louis, NICU), Tom Brazelton (Madison, WI, PICU) and Michael Trautman (Indianapolis, NICU). Also special thanks to our superb Section Manager, Niccole Alexander, and her entire Academy staff, who work at ensuring the highest quality teaching programs and publications. I encourage section members to become more involved by either running for Executive Committee vacancies or becoming involved in the numerous SOTM activities. Please feel free to contact any of us for more details.

It was wonderful welcoming so many members and non-members at this past fall’s SOTM Educational Program at the National Conference & Exhibition (NCE) on October 9, 2005, in Washington, DC. Chaired by Executive Committee Member Dr Bruce Klein and Dr Deborah Hoy (Washington, DC), the 2005 SOTM Scientific and Academic Session was filled with numerous relevant educational talks and state-of-the-art scientific research presentations. The program started with an open Business Meeting and lunch to review the activities and financial status of the Section. I am happy to report that we have solid reserve funds to ensure the future success of our section’s educational activities.

The afternoon was topped off by the presentation of both 1) the C. Robert Chambliss Best Paper and 2) the Section Best-in-Training Awards. Other lectures included such topics as a panel of experts debating legal issues as well as an overview of pediatric military transport experiences—both extremely relevant to what is going on in our world today.

The Planning Committee for the 2006

Continued on p. 2
Course on Neonatal/Pediatric Critical Care Transport Medicine has been very busy organizing this very popular biannual three-day course, again to be held in conjunction with the AAP NCE October 8-10, 2006, in Atlanta, GA. **Save the dates!** Make sure you let your other transport team members know about next year’s course. More information will follow in this Dispatch.

The upcoming 3rd edition of the *Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients* is slated for publication this year. This book will continue to serve as one of the foremost transport references with over thirty-two chapters and appendices, written by over 20 authors representing all aspects of transport. Topics will include not only standard material in program administration, equipment, safety and team training, but, also, new chapters will cover clinical research, legal issues, networking, database development and reimbursement.

Many section members have asked about the possibility of establishing a new separate pediatric transport journal. However, there is a significant economic reality at pursuing this noble venture without significant outside financial support. Therefore, we are now focusing on establishing formal connections with major pediatric journals to facilitate the publication of transport articles. To achieve this goal, we are currently working at establishing new editorial board positions in some of the major pediatric journals; we will keep you posted on this important endeavor to increase our specialty’s visibility. In the meantime, I encourage you to volunteer as journal peer reviewers to ensure that transport specialists are the clinicians actually critiquing these articles and giving their authors the fairest opportunity at publishing. I welcome your ideas as to other new initiatives we should pursue.

Remember that you can always post your comments on the SOTM LISTSERV® which is reached by email at transmedaap@listserv.aap.org. You can also use the LISTSERV® to ask fellow transport clinicians interesting questions and discuss fascinating cases or published literature.

As always, I would like to thank Dr Michael Anderson (Cleveland) for serving as the editor of this publication, the *Transport Dispatch*. The success of the *Dispatch* is essential in ensuring that our section members know about past present and future activities in a timely manner. Please email Dr Anderson (michael.anderson@case.edu) if you have ideas for future articles. Finally, I would like to thank Niccole Alexander, her very supportive Academy staff, and each member for your continued support. I am truly honored to serve as Chairperson. Please forward me your ideas, suggestions, and, as always, criticisms.

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**National Emergency Medical Services Week**

*May 14-20, 2006*

May 15-21 marks this year’s annual effort to bring together local communities and medical personnel to publicize safety, as well as honor the dedication of those who provide the day-to-day lifesaving services of the medical front line. As a partner in this effort, the American Academy of Pediatrics also applauds the 20-year anniversary of the first funding grants awarded by the federal Emergency Medical Services for Children (EMSC) program. This agency has reached out to medical professionals nationwide to advocate and promote improved medical care for children, with Wednesday, May 18, designated specifically as EMSC Day during EMS week.

[to order a planning kit: http://www.acep.org/webportal/Advocacy/EMS/Week/default.htm](http://www.acep.org/webportal/Advocacy/EMS/Week/default.htm)

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**American Academy of Pediatrics**

**National Conference & Exhibition**

*Atlanta, GA*  
*October 7-10, 2006*

See Course on Neonatal & Pediatric Critical Care Transport Medicine on page 4.
CONGRATULATIONS TO THE WINNERS!

C ROBERT CHAMBLISS MD BEST PAPER AWARD
MISDIAGNOSIS BY REFERRING FACILITIES: AN OPPORTUNITY FOR THE PEDIATRIC TRANSPORT TEAM
Jessica A Strohm-Farber, MSN, RN, presenter
The presenter received a certificate and a $500 honorarium.
Purpose: Under-diagnosis and over-diagnosis by referring facilities have been identified as potential areas for improvement. Under-diagnosis may be associated with under-treatment or treatment delays, while over-diagnosis may increase the risk of iatrogenic injury. Considering misdiagnosis in the context of medical errors, we identified the need to review such cases to identify opportunities for the transport team to optimize care.

BEST-IN-TRAINING PAPER
QUANTIFICATION OF IMPULSE BY NEONATES DURING TRANSPORT USING A SPECIALIZED AIR-FOAM MATTRESS AS MEASURED BY BIOPHYSICAL ACCELEROMETRY
Shetal I Shah, MD, presenter
The presenter received a certificate and a $250 honorarium.
Purpose: Transport of newborns incurs morbidity, including intraventricular hemorrhage. The force transmitted to the neonate due to road conditions may contribute to increased morbidity. This force, measured per unit time (impulse), is not well characterized. The study quantified the magnitude of impulse experienced by neonates using a novel biophysical model and determined whether a specialized air-foam mattress can reduce the impulse experienced.

If you would like detailed information on the abstracts presented during the program or during any other NCE-related session, please visit the abstracts online website at http://www.abstracts2view.com/aap/.

And if you are interested in competing for one of next year's top prizes, submissions are welcome until April 14. Submit electronically at http://www.aap.org/profed/cfa.htm.
American Academy of Pediatrics
2006 National Conference & Exhibition
Course on Neonatal and Pediatric Critical Care Transport Medicine
Atlanta, GA

Sunday, October 8
Plenary: Risk Assessment for Transport Teams
Abstracts
Plenary: Transport Team Liability
Abstracts
Reception

Monday, October 9
Section Business Meeting
Plenary: Transport Scoring Systems: Are They Ready for Use?
Panel: How Real Disasters Impact Pediatric Transports
Breakout Sessions:
  - Transport Administration
  - Transport Effectiveness/Profit and Loss
  - Treatment Protocol Development
  - Reimbursement Workshop
  - High-Tech Kids (CSHCN)
  - Pediatric Transport Case Studies
  - Neonatal Transport Case Studies
  - The Surgical Neonate during Transport

Tuesday, October 10
Plenary: Transport Standards
Plenary: Is High-Tech Support for Transport Value Added or Added Fluff?
Panel: How Will Changes in Medicaid Reimbursement Affect Transport Teams

If you are interested in obtaining a copy of the 2004 course syllabus, please see next page.

Call for Abstracts for the Transport Course
Submission Deadline: Friday, April 14, 2006
2004 Course on Neonatal/Pediatric Critical Care Transport Medicine Syllabus Order Form

Shipping Address:

Name: ____________________________________________

Address: _________________________________________

__________________________________________________

City, State: ________________________________________

Zip: ______________________________________________

Phone: ___________________________ E-mail: ___________________________

Method of Payment

The Course Syllabus is $15.00 (includes shipping costs).

☐ MasterCard   ☐ Visa   ☐ American Express

Card Number: _________________________________________

Expiration Date: ____________

Cardholder’s Signature: ________________________________

FAX CREDIT CARD ORDERS TO:
Niccole Alexander – 847/434-8000

☐ Check (Made out to “American Academy of Pediatrics”)

Checks should be mailed to:
S. Niccole Alexander, MPP
Section on Transport Medicine
American Academy of Pediatrics
141 Northwest Point Boulevard
Elk Grove Village, IL 60007
The past year marked the 20th anniversary of the federal Emergency Medical Services for Children (EMSC) program. Over the past two decades, EMSC has helped lead the way towards systematic improvements in the delivery of emergency care to children in every state of our nation. Contributions by the EMSC program have resulted in remarkable advances in pediatric emergency care and substantial improvement in the quality of life of countless ill and/or injured children. The EMSC program is undoubtedly responsible for saving many young lives. While opportunities for further improvements lie ahead, the program’s 20th anniversary was reason for all pediatric emergency care advocates to celebrate.

2005 was also a year of great concern for EMSC advocates. The President’s budget plan for Fiscal Year 2006 requested no funding for EMSC, effectively proposing to eliminate the program. This zero funding decision was driven, in part, by a critically flawed White House Office of Management and Budget (OMB) evaluation of EMSC, which determined that the program had failed to demonstrate its effectiveness. In addition to the threat posed by this ominous budget proposal, the EMSC program’s seven-year authorization expired at the end of the 2005 fiscal year.

Authorization is the federal statutory authority to spend money for a given purpose or program. If an authorization expires, a program does not necessarily cease to exist; if funding continues to be allocated, the program can continue (e.g. the authorization for the National Institutes of Health expired in 1999). However, reauthorization is an important process as it provides the opportunity to review the scope and effectiveness of programs and make needed changes. EMSC would obviously benefit from the passage of an effective reauthorization bill.

Appropriations, the federal funding process, represents a perennial challenge faced by EMSC. Thanks to effective advocacy, annual funding support for EMSC has grown steadily over the past 20 years, from $2 million to nearly $20 million. The House and Senate Budget Committees examine the President’s proposed annual budget, make various changes and adjustments, and determine an overall allocation within which each of the Appropriations Subcommittees must work. Fortunately, both houses of Congress recognized the need for continued funding support for EMSC, with the Appropriation Subcommittees of the House of Representatives and Senate agreeing to provide $20 million for Fiscal Year 2006. This recommendation (HR 3010) – which was subject to a 1% reduction (down to $19.8 M) – was signed into law by the President on December 30th, 2005.

So why should we be concerned? Well, perhaps because so much is at stake. EMSC funding has made its way to every State, the District of Columbia and the 5 U.S. Territories, assuring that necessary attention would be given to pediatric emergency care concerns within each state’s EMS office, raising the bar for pediatric emergency care. EMSC has also fostered multi-disciplinary collaboration within and between states. This regional and national perspective has reduced discrepancies in regulations among states, has resulted in the establishment of national norms for pediatric emergency care and has made children’s issues in emergency medical care a national priority.

EMSC has partnered on key program initiatives with numerous professional societies. The program has also provided funding support for the EMSC National Resource Center [http://www.ems-c.org], which provides the nation with educational and informational resources focused on improving the system of care for children. EMSC also supports the National EMSC Data Analysis Resource Center (NEDARC) [http://www.nedarc.org] which assists EMSC grantees and State EMS offices to improve their ability to collect, analyze, and utilize data to improve the quality of pediatric care.

EMSC has also been a very important source of funding for “targeted issues” and “demonstration” grants that have contributed to increasing evidence-based care for acutely ill and injured children. Research is an essential element in the development of an evidence-based practice of medicine. The practice of evidence-based pediatric emergency medicine is needed to provide the best treatment for acutely ill or injured children. Unfortunately, in many situations, emergency care providers must rely upon limited or anecdotal experience because reliable research studies involving acutely ill and injured children are few.

EMSC funding created and now provides ongoing support for the infrastructure of the Pediatric Emergency Care Applied Research Network (PECARN). This research network [http://www.pecarn.org] is a vitally important venue where multi-center collaborative research regarding the care of acutely ill and injured children has begun. PECARN has ex-

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EMSC EDITORIAL

Emergency Medical Services for Children continued

experienced impressive growth, having just completed its fourth year; the network has competed successfully for six federally funded research projects. Without the infrastructure support of the EMSC program, the PECARN network would not exist. Ongoing funding for this network is critical to ensure that we gather the best evidence on which to base the treatment of critical illnesses and injuries in children.

The EMSC program has therefore been active on many fronts benefiting the interests of the children we care for. Many of the standards for the care of ill or injured children we take for granted today might never have been achieved without the focused pediatric initiatives and funding resources provided through EMSC. While there have been significant advances in the delivery of emergency care to children, for several reasons a substantial gap between pediatric and adult emergency care still exists.

The future of EMSC, and the great promise it holds for further advances in pediatric emergency care, now requires unified advocacy and action by all who care about or for children. With funding for 2006 finally established, we soon must be proactive in planning to address the issues of EMSC program authorization and appropriation. The President’s budget proposal for 2007 will be due in February. In the wake of the devastation of Katrina and Rita, competition for limited funding resources will likely be greater than ever before. We should assume that continued funding for EMSC will require strong bipartisan support.

2006 will also mark the release of the report of the Institute of Medicine (IOM) Committee on the Future of Emergency Care in the U.S. Health System [http://www.iom.edu]. The IOM panel’s report is due to release in the late spring. The panel had three working groups – one dedicated to pediatric emergency medicine and one each to pre-hospital and hospital-based emergency care. A comprehensive report and specific recommendations related to each of the areas of focus is greatly anticipated.

So, what can each of us do to advocate for EMSC? First, we must become familiar with the contributions of EMSC as outlined above, as well as in our own states and communities, and the process and participants in the legislative events that may determine the future of EMSC. We can each be an effective advocate for children and EMSC through our local institutions or simply as concerned citizens. Our elected officials and their appointed support staff need to become familiar with the many great things that have been accomplished through the program. In conveying this message, local (state-based) examples are more compelling than national experiences. While EMSC grantees cannot engage in political advocacy (e.g. lobbying) – they can actively participate in activities which educate elected officials, key decision-makers and the public about the important role filled by EMSC and the vital contributions the program has made.

As we advocate (or simply educate others) on behalf of EMSC, we would be wise to follow the lead of experienced political advocates and lobbyists within key stakeholder organizations such as the American Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP), American College of Surgeons (ACS), Emergency Nurses Association (ENA), National Association of Children’s Hospitals and Related Institutions (NACHRI), National Association of EMS Physicians (NAEMSP), National Association of State EMS Directors (NASEMSD), and the National Association of Emergency Medical Technicians (NAEMT) - to name a few. We should all contact our members of Congress on this issue. This can be done by e-mail (see www.house.gov and www.senate.gov to find your Representative and Senators) or through the Capitol switchboard (202-224-3121).

The good news is that EMSC still has influential advocates in both the Senate and House of Representatives, and many professional organizations like those listed above, working hard on behalf of the program. We need to work effectively with elected officials in all sectors, and in a bi-partisan fashion, to assure the continued contributions and progress made by EMSC, and the future of the children we serve. Considering the great challenges that lie ahead, we also need to identify, educate and enlist the support of ‘new’ advocates in both federal and state governments.

An examination of the past two decades provides a great sense of pride in the accomplishments achieved, and great promise for what we could achieve over the years that lies ahead. Please join the editorial board of Clinical Pediatric Emergency Medicine in hoping that the 2005 celebration of 20 years of the EMSC Program will lead us towards a renewed commitment to meeting the needs of acutely ill and injured children, and the pursuit of the wonderful things that are yet to come from a vigorous, innovative and well-funded EMSC Program.

Steven E. Krug, MD
Editor in Chief, Clinical Pediatric Emergency Medicine
Chair, American Academy of Pediatrics Committee on Pediatric Emergency Medicine

7 | TD | Spring | 06
In 2005, I had the privilege to respond to the U.S. Navy Hospital ship Mercy when it was deployed for a second time to the Indian Ocean on a medical mission to assist the people of Indonesia. It was my first experience with Project HOPE, a non-governmental organization (www.projecthope.org) which had partnered for the first time with the Navy to co-staff disaster relief operations on board the ship. The Mercy was first sent to the area after the tsunami as part of Operation Unified Assistance—a relief operation that moved millions of pounds of relief supplies and included more than 20 vessels and 15,000 personnel. After being demobilized and after traveling halfway back to its home port of San Diego, the ship was ordered back to Nias Island, Indonesia after a magnitude 8.7 earthquake on March 28th, 2005. I was part of a group of 50 civilian doctors and nurses who were sent to supplement medical operations for this second disaster mission.

The role of the ship was to support the medical care available on the island with the equivalent of a tertiary care referral center. The ship offers substantial medical and surgical subspecialty care and the infrastructure to support it. Labs, CT scan, OR suites, and ICU facilities complement a large Emergency Department called Casualty Receiving or “CasRec.” All patient flow on or off the Mercy was by several non-medically configured Seahawk helicopters, with a 15-30 minute transport time. After two days of orientation, I was assigned the role of triage physician on shore. Along with another Project HOPE volunteer, Dr. Michael Polifka, we were responsible for coordinating the flow of patients to the Mercy for emergent or urgent tertiary care and admission to the ship’s wards. In the triage role, we were not initially equipped with medical gear as the goal was to work with the providers on the island to identify and evacuate patients requiring evacuation. In the capital city of Gulung Sitoli there was a large outdoor hospital that was staffed by one visiting physician as well as a large group of local nurses and nursing students. There were also field hospitals being staffed by both Russian and Japanese rescue groups as well as the Indonesian military. Many other agencies as well as the WHO and the UN were involved in coordinating this complex response effort.

After several years as a transport physician in Philadelphia and Los Angeles, I had become accustomed to working in the field with an extensively trained crew and an extensive supply of equipment. Within two hours of arrival on our first day of operations, Dr. Polifka and I were met by a missionary nurse who physically dragged us to a treatment room at the hospital. Here we found a small child who was gasping for air and dripping with sweat. The child was receiving a maintenance drip of dextrose in water and was on a nasal cannula operating from a large tank. There was no other airway equipment available, and no ambulance to call for supplies. The nurse had spent the past two days transporting this child with probable pneumonia to Gulung Sitoli from a village in the backcountry. A brief exam revealed a child in imminent respiratory failure who needed urgent intubation. A retired Navy Admiral and orthopedic physician assisted us in finding a vehicle to move the child to the landing zone outside of town, and in facilitating an urgent pickup to evacuate the child to the Mercy by air. There were some delays because this was our first day of operations, and by the time we launched with the child in arms, he was requiring periodic rescue breaths. After a harrowing 20 minute flight we arrived on the deck, rode the elevator to CasRec, and were received by a large pediatric resuscitation team. Within moments, the child was ventilated and then intubated, IO lines were placed, and fluid resuscitation had begun. Appropriate antibiotics were given, and the child was admitted to a makeshift PICU. He made an excellent recovery due to the efforts of one dedicated nurse in the field and an outstanding civilian and military crew on the Mercy.

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GUIDELINES FOR AIR AND GROUND TRANSPORT OF NEONATAL AND PEDIATRIC PATIENTS

Third Edition

Authored by the American Academy of Pediatrics

Section on Transport Medicine

Transport Medicine continues to be an important component of health care delivery. This essential guide provides guidelines and education for all health care professionals who make decisions about the emergency inter-facility transport of children.

To order a copy of the second edition of the manual, call the AAP Customer Service Center at 866/THE-AAP1 or 866/843-2271.

The third edition of the Guidelines is scheduled for publication fall 2006!

For more information, please contact Niccole Alexander, at nalexander@aap.org.

The Pediatric Transport Database

The Section on Transport Medicine’s (SOTM) Pediatric Transport Team Database is a collection of self-reported data on teams across the United States. The results of our survey is currently posted on the SOTM web site.

Information reported:
- Name of sponsoring institution
- Whether there is a unified team available—one team that performs pediatric and neonatal transports—or specialized teams
- Name of pediatric team medical director and contact information
- Name of neonatal team medical director and contact information
- Name of pediatric team nurse manager and contact information
- Name of neonatal team nurse manager and contact information
- Emergency telephone number to access
- Subspecialty pediatric/neonatal services available at the sponsoring institution.

How did we do it?
Staff circulated a request form during the 2004 Course on Neonatal and Pediatric Critical Care Transport Medicine and also through LISTSERV and membership e-mail lists. The information was summarized and posted in PDF format on the Transport Medicine web site at http://www.aap.org/sections/transmed/.

The database is a static document that will not be updated again until summer 2006. A request for information will be circulated to catch any changes and edits and to add new information to the next iteration. Also, we will expand our reach to include the AAP Sections on Emergency Medicine, Critical Care and Perinatal Pediatrics and hope to have one of the most inclusive and expansive rosters of pediatric transport teams around.

Would you like your team to be included next time?
If you would like your name added to the e-mail list to ensure that you receive the request for information this summer, please send a message to Niccole Alexander at nalexander@aap.org with “Transport Database” in the subject line.

Disclaimer: All information is self-reported. We have not confirmed/double-checked any of the submissions.
Although providing medical care is not typically in the job description of the triage doctor, having two physicians in this role allowed one of us to shift roles and prioritize the care and evacuation of this urgent case. This case which occurred two hours into a month-long mission demonstrated the most important lesson that I learned on this deployment: that there are no rules in a disaster. Flexibility was as important as capability as responders began to help the island community deal with the thousands of dead, sick, and injured. Taxis became ambulances, nursing students became teachers, and ordinary people became heroes. Family members went to extreme lengths to care for their sick relatives, share food with their neighbors, and lead strangers to the hospital. The resiliency in this community was inspiring. On the sixth day after the earthquake, the schools were open even though the facilities were not usable. Children walked over the rubble in the street in uniform with their friends, and classes were conducted in the courtyards. The capital city was demolished but the spirit of the residents was strong.

A month later the Mercy left to return to San Diego again and I returned home to Massachusetts. I had met hundreds of patients and helped transfer many of them to the ship for tertiary care. I was awed by the capabilities and commitment of the people of the U.S. Navy who tirelessly provided aid for weeks on end. I had worked side by side on the island with patients and providers from Indonesia, the U.S., Singapore, Russia, Japan, Sweden, and France. I had adapted to working with limited equipment and with a restricted ability to communicate. I was fortunate to have experienced a culture where the care of your neighbor was as important as the care of yourself, and where the focus after a disaster was on recovery and not dependence. The opportunity to deploy to Indonesia was unexpected, but the rewards from doing so will benefit me personally and professionally for the rest of my life.
We Respond . . .

personal stories of relief efforts in the aftermath of Hurricanes Katrina and Rita

When Katrina hit New Orleans and the Gulf Coast, many thousands of children were affected, and the AAP responded with voluntary, monetary, organizational and advisory services. At the same time, many individual pediatric professionals rose to a multitude of challenges in order to care for the young victims. Some were on site and rode out the storm and its aftermath, keeping clinics or hospitals open if possible and evacuating when necessary. Others traveled to the region to help colleagues and their patients devastated by the storm and to volunteer with relief agencies.

Those involved in these efforts experienced the depths and heights of emotion, but the teamwork required brought out feelings of pride for these pediatric professionals on both the giving and receiving ends in dramatic scenes of rescue, relief and evacuation.

On the following pages are firsthand accounts of some of these efforts along the hurricane-stricken Gulf Coast.

One Man’s DMAT Tale: Close Encounters with Two Hurricanes
David M. Kissin, BS RRT-NPS
Freeport, ME

Angel One
Connie Eastlee RN, MS, CMTE
Director, Angel One
Michele Moss, MD, FAAP
Medical Director, Angel One
Arkansas Children’s Hospital

Extraordinary Evacuation
By LeAnn Wilson, BS, RRT, CMTE
Children’s Mercy Critical Care
Kansas City, MO

Small and Smaller
Joanne Minnick, RN
Methodist Children's Hospital Pediatric and Neonatal Transport Team
San Antonio, TX

Disaster Preparation and Lessons Learned
Harley G. Ginsberg, MD, FAAP
Medical Director, Neonatal Intensive Care Unit
Ochsner Foundation Hospital
We Respond . . .

Close Encounters with Two Hurricanes

David M. Kissin, BS RRT-NPS

Editor’s Note: The Department of Homeland Security (DHS), through the National Disaster Medical System (NDMS) fosters the development of Disaster Medical Assistance Teams (DMATs). A DMAT is a group of professional and para-professional medical personnel (supported by logistical and administrative staff) designed to provide medical care during a disaster or other event. [http://ndms.dhhs.gov/dmat.html](http://ndms.dhhs.gov/dmat.html)

We knew it was going to be bad. We had pre-positioned ourselves in Alabama waiting for Category 5 Hurricane Katrina to land. Accompanying everything was a sense of dread, amid the wild winds and sideways rain. In the aftermath, there were some tree limbs on the road, but our Massachusetts 1 DMAT unit escaped relatively unscathed.

Then it was on to Mississippi in a convoy of six SUVs and three trucks with all of our equipment. With each passing hour, we saw increased damage the further south we traveled. When we arrived at Camp Shelby, Miss., we saw many enormous trees uprooted, buildings leveled, and roadways blocked with debris. We arrived at night, fitfully slept on old army cots and got our mission the next day. We were to travel to Hattiesburg, Miss., to help with evacuation of critical patients at Forrest General Hospital’s Emergency Dept. which was overwhelmed with patients. The hospital had no running water, no air conditioning and sputtering generators. To make matters worse, the temperatures climbed above 100 during the day with about 300 percent humidity and fell only slightly into the 90s at night with no relief in humidity.

After we arrived, we assimilated ourselves into the ER, tried to follow the hospital’s paperwork and helped increase the patient flow immensely. By this time, our commanders ascertained the need for us to set up our own ER, composed of three tents: a command center for administration and communications, a major tent for life-threatening, major emergencies and a minor tent for treating the less-severely injured and sick. Everyone, including surgeons, nurses, nurse practitioners, physician assistants, respiratory therapists, EMTs and paramedics pitched in to erect the tents. It is hard and heavy work, but we train in it twice yearly, so it was no surprise to anyone.

When You’re Weary

By the time the tents were set up, stocked to our liking and ready for patients, we were all a little tired. We slept in an evacuated residential home for anorexic women. There were no electricity, running water or beds. I found a sofa in the corner of the living room and rolled out my sleeping bag there. Next morning, we started seeing patients. The hospital’s ER worked with all the chest pain and shortness-of-breath patients, but everyone else came to us first at a triage area we set up for both facilities. From there, patients were sent to one of our tents or the hospital ER.

In addition, we helped evacuate four ventilated patients more than 90 miles to a facility with electricity in Jackson, Miss. Three patients were in transported in ambulances and accompanied by RNs from our unit and the hospital. Another patient was evacuated by helicopter with one of our burn specialty critical care nurses. We also provided assistance with the evacuation of 20 dialysis patients who had been without treatment for a week. These went to Jackson as well; all were sent by Greyhound bus accompanied by one of our best paramedics.

Two days later, the hospital regained electricity and water and could resume normal operations. Our food consisted basically of meals-ready-to-eat (MREs), but we were surprised on our final day when a crew from the local Applebee’s Restaurant provided us with platters of hot wings, veggies and assorted goodies. It was the community’s way to thank us for our help. That night, we packed up our tents and equipment, and by the next morning our convoy headed to Keesler Air Force Base at Biloxi. From there were sent to Picayune, Miss., where there were supposed to be 120 dialysis patients languishing without their treatments and a nursing home with several very sick occupants.

Scrambled Messages

Communications have a way of getting scrambled in the aftermath of a storm. When we got to the Emergency Operations Center in Picayune, we discovered that the 120 dialysis patients were spread over the entire region, and the nursing home was fine. With this information relayed to emergency officials, the FEMA management team asked us to return to Biloxi for further instructions. We arrived there late at night, and since there was no place for us to bivouac, we set up our sleeping bags outdoors under the stars on a basketball court in an attempt to grab a good night’s sleep.

Several other teams were also staged at Keesler. We basically lived in two empty classrooms, thirty-five of us arranging ourselves as comfortably as possible while awaiting a mission. To fill the time, we played cards, shopped at the base exchange for sundries we had forgotten, including actual food. We watched movies on computer, we read and we talked.

Finally, we were tasked. We had a mission to visit several neighborhood fire stations and ascertain any need of our services. We also were sent to two county health departments to bring drugs, especially tetanus boosters. Both centers were abandoned and shuttered. One center was located next to a hospital, which turned out to be well equipped, but our volunteers did help administer some shots before returning to base.

Skeleton on the Beach

One of our strike teams found an abandoned hospital that was structurally intact near the coast. The hospital had been saved.

Continued on p. 13
because a three-story hotel in front had taken the brunt of the 30 - 40 foot storm surge. There was water damage to the facility but nothing major or irreparable. Gulf Coast Regional Hospital administrators determined we could provide services so the hospital could get up and running.

We convoyed to Gulfport, MS, set up our tent and started seeing patients, slowly at first, until word got out that we were there and providing care and tetanus shots. We slept on the floors of an outpatient clinic, the OR and recovery rooms. We still ate MREs.

We joked with the patients, helping them keep their minds off their troubles, and with the hospital staff, who embraced us for our help. As the situation improved and electricity and water came back on line, some of our team went to a local store, bought a grill, charcoal, meats and fruit, and we had a grand old cookout. I played chef du jour for the occasion. Later that evening, a former patient arrived in a big pick-up truck filled with chicken dinners, fixin’s and mini-pies. He was a cook for an old cookout. I played chef du jour for the occasion. Later that evening, a former patient arrived in a big pick-up truck filled with chicken dinners, fixin’s and mini-pies. He was a cook for a chuck wagon feeding the electrical workers and knew we had been subsisting on MREs. What a party! The following day, he returned with hamburgers, hotdogs and sausages galore!

None of the people we saw in Mississippi were self-pitying. They mostly talked of being fortunate for having their lives and their families and said everything would eventually work out. This was in the midst of major devastation. The entire Gulf shoreline looked like it had gone through a nuclear holocaust. Entire neighborhoods were flattened. Restaurant signs signaled the remnant of what lay beneath the rubble. Homes were destroyed, their upper floors relatively unscathed with the bottom levels totally annihilated, washed out to bare girders. Here and there an elevator stood alone or a staircase led to nowhere.

One mini-golf course was totally destroyed except for a novelty character—Humpty Dumpty. Casino barges had been washed ninety yards on shore, some of them crashing through hotels. Everywhere, boats were becalmed in trees, yards from the nearest water. Mattresses dotted a landscape filled with sand, buckled roads and crushed homes sporting warnings signs like: “You loot, we shoot” and “Looters Beware.” It was unforgettable.

**Time to Say Farewell**

Eventually our 14-day mission ended and we packed our stuff, said tearful goodbyes to the staff and returned home. I traveled home alone, arriving early on a Sunday morning. Exhausted and spent, I sank into a real bed, with soft pillows and a cover for the first time in two weeks. Early the next morning, my son roused me out of bed early. It felt so good, so right.

Emotions run high in any disaster situation, and this was no exception. Adrenalin, compassion and a desire to help add up to emotional depletion. It takes time to reinsert oneself back into the “routine.” But my days in my own bed were to be short lived. I had been back to work for only three days when I received a request to re-deploy, this time to New Orleans. Once again, our thirty-five member MA-1 DMAT was asked to backfill the NY-2 DMAT at West Jefferson Medical Center in Jefferson Parish. Four hours after being paged for duty, I was headed for New Orleans.

Now in New Orleans, I was met by fellow DMAT members and the team drove to the deployment site. We got a bird’s eye view of the destruction. Boats sat abandoned in the middle of roadways; watermarks scored the sides of buildings 5 - 6 feet off the ground. The roof of the Superdome was peeled off, and cars were crushed by fallen bricks or washed into other vehicles. And everywhere there was mud, mud, mud.

At the Jefferson Hospital site, the New York DMAT tents were set up in the forecourt of the hospital. There were four tents in all: an administration/commo tent, a yellow/green (non-emergent) tent, a triage/meeting tent and the red (emergent) tent. I was assigned to the red tent and found myself working with an eclectic group of DMAT members, MA-1, Texas and Minnesota, in addition to New York.

We set up a shot clinic, immunizing people against tetanus and Hepatitis A and B. We averaged 250 patients in a 12-hour shift. I also worked with a 14-month-old with croup and a supposed mass casualty incident (MCI) patient from a nursing home that had been without care for days. We expected to get more than 60 patients from that home.

**Engaging Work**

We prepared for the worst, setting up several ventilation-assist areas with two Eagle ventilators, H-cylinders of oxygen and manual resuscitators. We were all chomping at the bit for some real emergency, disaster medicine, when the first patient rolled in the door. Thankfully, he was an obtunded, elderly gentleman, wearing two liters of oxygen by nasal cannula. He needed observation. The next patient was on room air. Again, thankfully, the EMTs reported these were the most critical patients. We did see some major injuries, mostly from carelessness with chainsaws. One guy cut his lip after the chainsaw kicked back into his face. We also worked with a policeman with status asthmaticus and a young woman with diabetic/renal failure.

We also saw our share of sad stories, like the guy who had slipped and fallen on the muddy steps of his UPS delivery van and was then told that after 28 years of employment, he no longer had a job because business was too slow. He had no home, no food and no job. “How are my wife and I going to survive?” he asked. We sent him on to talk to some of the world’s best social workers who deploy with our DMAT.

Meanwhile, Hurricane Rita started kicking up her heels. Our

**Continued on p. 14**
Arkansas Children's Hospital serves the entire state of Arkansas and surrounding states as the only children's hospital in Arkansas. Angel One operates two S76C+ helicopters, three ground ambulances and on demand fixed wing, transporting annually over 2100 neonates and pediatric patients.

We initially became involved with the Hurricane Katrina rescue effort on Tuesday morning, August 30th, when Tulane Hospital called us to accept two specialty patients. Angel One sent one helicopter and two medical teams in the S76C+ to Alexandria, where we met two Acadian helicopters, and transported the patients to Little Rock. Additionally, Tulane Hospital called to request transport for a fifteen year old patient dependent on a Thoratec Ventricular Assist Device (VAD) which weighs about 500 lbs. The helicopters that were assisting in patient transports out of Tulane Hospital could not carry the VAD. Angel One arrived at Tulane in the evening with 1000 lbs. of water and food, amid gun shots and police presence to secure the landing zone. Flying in was more notable by the blackness except for flashlights on rooftops and the use of air traffic control by an AWACS plane flying over the Gulf of Mexico. The patient had been maintained on a small generator as the hospital generators were no longer functioning. He was hand pumped while being carried down three flights of stairs and transported over to the makeshift helipad. The 500 lbs. VAD had to be carried also! Angel One then safely transported the patient, his nurse and 500 lbs. Thoratec VAD to Texas Children's Hospital in Houston. The patient and the nurse really enjoyed cold water and air-conditioning in the helicopter!

On Wednesday, August 31st, Angel One responded with one helicopter and two wing jets to stage out of Baton Rouge on request from Children’s Hospital New Orleans (CHNO). The Angel One helicopter flew dual pilots, a helicopter mechanic, attending physician, flight RN and flight RRT on board to care for the pediatric and adult patients transported. Additionally, Texas Children’s Hospital in Houston, Cook Children’s Hospital in Fort Worth, and Mercy Children’s Hospital sent fixed wings while Miami Children’s Hospital in Miami sent a helicopter to evacuate thirteen critically ill PICU (Pediatric Intensive Care Unit) patients and family members from CHNO to Baton Rouge by helicopter and then by fixed wing to Texas Children’s Hospital in Houston.

Angel One helped coordinate the CHNO evacuation of the critically ill PICU patients with CHNO and the other children’s transport team by telephone conference calls. Our communications center was really hopping with two dispatchers and multiple others on line to help with communication. Angel One also worked closely with Acadian Ambulance and their command center to coordinate the evacuation of CHNO. Kansas City also sent C130s from the Air Guard to evacuate and transport forty-plus pediatric medical surgical patients and family members to Mercy Children’s Hospital in Kansas City.

On Thursday, September 1st, the Angel One helicopter responded to Touro Infirmary, Tulane parking Garage, Meadow Crest Hospital in Gretna, and Ochsner Hospital in New Orleans and transported twelve patients (seven were intubated and ventilated on four missions) with an Acadian Ambulance Flight Coordinator. The two jets returning from Houston transported two critically ill pediatric patients, one from Baton Rouge and one from Lafayette back to Arkansas Children’s Hospital in Little Rock.

Finally, Angel One also sent one ground ambulance to New Orleans on the request of the Arkansas State EMS Department. The ambulance was deployed for seven days and transported nineteen patients total, with many search and rescue missions performed from the New Orleans Staging Area. On one of the trips to Baton Rouge our paramedics helped deliver full term twin boys! All did well – the mother, the twins, and the paramedics.

command staff developed an evacuation plan for us should we need to bug out because of Rita. We were lucky to have to deal only with some rain and wind. Damage was limited to the roofs of our tents blowing off, allowing in rain waters which damaged some equipment. Temperatures were well into the 100s outside, but we were relatively comfortable with an inside temp of 80 degrees. Needless to say, the fourteen days I spent on this mission were busy, emotionally draining and extremely satisfying. We were performing what we are trained to do.

By the end, nearly all of us had been deployed for most of September, and we allowed ourselves a little decompression time. We went to a restaurant for a team meal and demobilized. We traveled as a team to Memphis, pausing long enough to drive by Graceland.

Nothing ever truly prepares you for deployment. People react differently to the same circumstances, and it takes a special team dynamic to make it work. I am proud that I am a member of MA-1 DMAT team. We live and work like a family with mutual respect and camaraderie seldom seen in this type of environment. I would go anywhere at any time with the wonderful professionals in my DMAT unit.

Dave Kissin is a Freeport, Maine practitioner.
On Wednesday, August 31, Children’s Mercy Critical Care Transport (CMCCT) took part in the largest pediatric transport in history. Children’s Hospital of New Orleans was preparing to close due to rising water levels, minimal electrical support, and limited supplies and resources. As the hospital was preparing to close, Randall O’Donnell, President and CEO of Children’s Mercy Hospitals and Clinics, offered to help. Children’s Mercy Critical Care Transport quickly assembled a critical care team of five transport nurses, three transport respiratory therapists, and one pediatric intensive care physician to mobilize to the Hurricane Katrina stricken area to evacuate patients to Children’s Mercy.

The team pulled together and provided cases of IV fluids, medications, monitoring equipment, food, water, linen, oxygen supplies, and more. With the help of Missouri Senator Kit Bond and the 139th Airlift Wing of the Missouri Air National Guard, CMCCT utilized two C-130 Hercules airplanes to evacuate Children’s Hospital of New Orleans’ pediatric patients.

Once in Louisiana, vehicles arrived one after another, transferring the care of twenty-six patients into our team’s hands. Pediatric patients lined the interior of the C-130. Patients and their families were once again at a critical moment, filled with emotions of hope and uncertainty. Just before nightfall, the flight back to Kansas City was underway. Approaching midnight, all on board the C-130s could see the emergency medical services and fire support awaiting their landing at the Charles B. Wheeler airport in Kansas City, MO. Fifteen ambulances were standing by to assist with ambulance shuttles to Children’s Mercy Hospitals and Clinics. Some of the littlest victims of Hurricane Katrina could finally breathe a sigh of relief as they were reunited with their family members at CMHC for admission. Tears of despair were finally gone for the families dealing with the aftermath of Hurricane Katrina. While the C-130’s were landing in Kansas City, a separate CMCCT crew was evacuating pediatric patients out of Baton Rouge, LA with our King Air C-90, taking them to Texas Children’s Hospital in Houston, TX.

It took the entire team to execute this evacuation without a hitch. In addition to the nine crew members on the C-130 Hercules and two on the King Air C-90, we had extra behind the scenes staff coordinating the flight, working with other agencies for pick up, and helping with the transfer of patients upon arrival in Kansas City and Texas. Additional CMCCT crew staffed the ambulances and aircrafts that stayed in our local area, keeping operations fully functional in Kansas City during the New Orleans evacuation.

We had the privilege of speaking to one of the parents this week, and she said “Children’s has been just wonderful!”

Children’s Mercy and many surrounding communities have come together to provide shelter, clothing, food, and gift cards for these New Orleans families. A special “thank you” goes out to the staff at Children’s Mercy Hospital and Children’s Mercy South who took care of all of these children and their families as they arrived in Kansas City.
This year the gulf coast was hit hard by the hurricane season. Hurricane’s Rita and Katrina were two of the most destructive hurricanes this season. Several hospitals were forced to evacuate their patients. On September 22, 2005 Governor Rick Perry declared an emergency and requested the recall of over 1,200 National Guard helping in Louisiana. Residents of Corpus Christi, Galveston and Houston were encouraged and over 1,200 National Guard helping in Louisiana. Residents of Rick Perry declared an emergency and requested the recall of evacuating their homes and head for higher ground. With expected winds of up to 175 mph and massive amounts of rainfall, flooding was of great concern for Texas. Another dilemma was how to evacuate the thousands of neonatal patients “small and smaller.” Some patients required ventilation, vasoactive drips, with our team following NRP and PALS protocols for treatment and transfer. The question was, “How do we get them here?” During the hurricane the State of Texas and FEMA had begun seizing aircraft and EMS vehicles and redirecting them. The lack of availability of ground and air carriers posed major problems to transporting teams that contract out carriers. We knew where the patients were but were not sure how we were going to get to them. The coordination of these transports demanded critical thinking skills and flexibility from the crews planning to evacuate the hospitals.

During Hurricane Rita, our Children’s Transport Team at Methodist Children’s Hospital was involved in the mass evacuation of several Neonatal Intensive Care Units (NICU) in Texas. We were placed on high alert on September 21, 2005 for the possible need for all of our teams to respond to the evacuation. Thus began the multiple “call-lists” and staffing preparations for these small patients. Our One Call Center was directly involved with the coordination of these transports and as soon as we were given a go, we left by helicopter, fixed wing and ambulances for our destinations.

Our first two crews left with San Antonio AirLife and Cardi Air to the University of Galveston (UTMB) for NICU patients that needed to be evacuated. The teams loaded five patients on a Bell 412 helicopter owned by San Antonio AirLife to head back to Methodist Children’s Hospital in San Antonio. Another team loaded 5 patients onto a Fixed-wing from Cardi-Air. After loading the patients both crews were notified the babies were to be transported to Seton in Austin to their Children’s Hospital. We now were taking the kids to Austin under the direction of the state.

About this time I left with my partner for Corpus Christi Medical Center by ambulance. We were sent to get “growers and feeders”. During the trip down Ali and I noticed several lines of cars and gas stations full of people waiting to get gas. Some stations were out of gas, boarded up and abandoned. Several cars filled with belongings, pets and boat trailers were on their way towards San Antonio, Texas. Much to our surprise when we arrived the patients were all on monitors and we had an extra patient to bring back with us. The staff was wonderful and thankful to see us. They had been waiting for help all day to evacuate their patients. We carefully assessed all of our kids and began placing them on monitors and securing them to our stretcher. We left, promising to be back for more and thanking them for all of their hard work. Later that evening the crews left for Corpus Christi Medical Center again and returned with more NICU patients.

This was the beginning of the next few days of bringing patients to San Antonio and after the storm taking them home. Our teams went to Houston, Beaumont, Corpus Christi and Austin. Many important lessons were learned in this evacuation; the need for meetings with the State in the future to have a state-wide plan for mass evacuation, a list of resources for fixed wing and helicopters programs that are capable of transporting pediatric and neonatal teams and a database with information of programs and their capabilities for hospitals when they are faced with these mass evacuations to help in the selection of transport teams. These three just alone would assist in alleviating a lot of the stress that occurred during the evacuations.

Something positive that we are able to reflect upon during the hurricanes was the immense amount of flexibility, critical thinking and tenacity of our staff that was evident in this process. Our nurses and respiratory therapists pulled from all of their experience and expertise to adapt to these situations and do what was necessary in the best interests of these patients. We all go to classes on teamwork at some point in our lives and this evacuation was a true test of it. I believe we succeeded and worked as a team but most importantly as a “family.”

Joanne Minnick, RN
Methodist Children’s Hospital Pediatric and Neonatal Transport Team
San Antonio, TX

A special thanks to the crew members involved:

Angela Crawford RN, CCRN
Jan Elliott RN, CEN, CFRN
Priscilla Davenport RN
Ginny Dufresne RN
Georgeann Henderson RN
Chris Auge RT
Ali Soujoudi RT
Joe Gonzales RT
Terry Vieyra RT
an imaginary hurricane strikes our city and causes catastrophic damage. Sometimes life imitates art. When Hurricane Katrina crossed the State of Florida and entered the Gulf of Mexico, New Orleans had a metropolitan population of 1.3 million with 484,000 inside the city limits. Much of the city lies slightly below sea level while the level of Lake Pontchartrain typically is one foot above sea level.

The Alton Ochsner Foundation Hospital is a 531 bed teaching hospital, which is situated on the east bank of the Mississippi River just west of New Orleans in the Parish of Jefferson. Providing incalculable benefit, the first floor of our hospital stands approximately six feet above sea level—twelve feet above some of the lowest parts of the city of New Orleans. The neonatal intensive care unit (NICU), located on the tenth floor of this eleven story hospital, was supporting twenty-five neonates, many on mechanical ventilation. One baby was on extracorporeal membrane oxygenation (ECMO). Though remaining a perpetual work in progress, the institution had established an Emergency Management Manual, which currently is 122 pages in length and addresses many topics including responses to loss of utilities, external and internal disasters and severe weather conditions.

The Ochsner model of medical care includes many satellite clinics and a closed medical staff for the hospital. Preparing for a natural disaster involves having a facility which would withstand the storm (externally and internally) and having a staff that can care for patients, their families and all personnel on campus. After deciding the “essential staff”, “A” and “B” teams are created. The “A” team members are staff remaining during the storm while the “B” team members evacuate, report their final destination to their unit directors, and then return to relieve the “A” team members once it is deemed safe to travel.

**CHRONOLOGY OF EVENTS**

**August 27: Two Days Prior to Landfall**

Katrina is now a category three hurricane, and her projected path has shifted westward. New Orleans, along with others on the Gulf Coast, are beginning to realize that there is likely to be a sizable impact from the storm. The administrators at Ochsner decide to implement the severe weather policy, assembling department chairmen (or their designee) to assign essential staff physicians. The pediatricians include a generalist/hospitalist, an intensivist, a cardiologist, a hematologist, a neonatologist (the author), and four neonatal nurse practitioners. In addition, general and specialist medical and surgical physicians and staff were appointed.

The Section of General Academic Pediatrics had rehearsed and implemented the hurricane drill numerous times in the past. The pediatric hospitalist would assume care of the in-house general pediatric patients and the nursery babies. The pediatrician-on-call would be responsible for phone calls. As it was a mandatory evacuation, all others would leave the designated hazardous area. It was a weekend so we hoped all would be back in clinic by Tuesday morning, business as usual.

Institutional plans were placed into effect regarding security, housing, communications, food services, and utilities. Team “A” members were reminded to bring their personal supplies (non-perishable food, water—one gallon/person/day, blankets, pillows, sheets, mattress, flashlight with batteries, medications, toiletries, extra clothes (shorts/sandals/sneakers), radio or small battery powered TV, and pocket change). Bringing family and pets into the facility was discouraged; however single “A team” parents and others with no alternatives were given this opportunity. If a family arrived with small children, it was expected that age appropriate supplies would accompany them.

**August 28: One Day prior**

Katrina was upgraded at 1AM to a category four storm, and six hours later her sustained winds reached 175 mph exceeding category five classification. Beginning at 7AM, Ochsner Security posted guards at the entrance of the parking garages to ensure that all those entering were members of the essential personnel team. We had learned from previous hurricanes that many non-Ochsner personnel would attempt to use the safety of an elevated garage for parking such items as recreational vehicles and even boats. This created a situation that prevented Ochsner healthcare workers from finding a place for their own vehicles. “A” team members arrived, and housing arrangements were made using unoccupied interior patient rooms as well as rooms in our adjoining hotel. By using inflatable or foam mattresses, some physicians elected to set up sleeping quarters in their offices. SpectraLink wireless phones (which can be programmed to be similar to an office extension) were distributed to essential personnel.

That afternoon, the NICU hurricane shutters were closed, and although made to withstand winds in excess of 100 mph, the decision was made to transfer the twenty-five NICU patients to the Post Anesthesia Care Unit (Recovery Room) located on the second floor in the central portion of the hospital where there are no windows. The move went smoothly, including the hand cranking of the pump for the baby on ECMO. After settling all the babies in their new “home,” our staff prepared for the in-

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This allowed leadership to remain visible and address concerns—both real and imagined.

Ochsner’s food and nutrition department normally keeps on campus a food inventory which should support the patients, their families and routine support personnel for over two months. Additional cold food storage capacity was increased by using two refrigerated trailers. All dietary production and refrigeration equipment was supported by emergency generator power. It was anticipated that the food and nutrition staff would be feeding approximately 500 persons per meal. Unbeknownst to our dietary staff, they were about to prepare more meals than ever anticipated and for a much longer time period than ever planned.

For security purposes, everyone was reminded to make sure that their picture identification card was in plain view wherever they went. Non-medical personnel were tagged with specifically color-coded identification bracelets, which afforded them the safety and amenities of the institution. Clinic administration held an evening meeting for all medical and unit directors to ensure that we were all well versed on the latest hurricane and facility information. We planned to meet at least three times daily into the foreseeable future so that a consistent message could be brought back to the personnel on the front line. This allowed leadership to remain visible and address concerns—both real and imagined.

August 29: Day 0
Katrina’s eye crossed the Louisiana coast at 5AM as a category four storm with winds which had “weakened” to 125 mph. Naturally, the outer bands of the hurricane arrived many hours before. With no tall buildings near us, there was little buffering of the winds taking place on the tenth floor. The howling of the ferocious winds was heard in the stairwells and near windows. Electricity from our utility company failed at 7:45 AM, and our three diesel-powered generators (which are situated twelve feet above ground level and consume one hundred gallons of diesel/hour) began functioning immediately. An underground supply of 60,000 gallons of diesel fuel was kept by the hospital for just such an occasion. The generators provided power for limited air conditioning, emergency electrical outlets and lighting, air and vacuum pressure and oxygen. While emergency lighting allowed for work to continue, having a flashlight was a necessity for performing certain tasks. It was not long, however, before we began to feel the temperature and humidity rising. As fate would have it, after settling all the babies in the new NICU, the ceiling over the patient on ECMO began to leak. The nurses and respiratory therapists obtained large plastic sheets and created a makeshift tent, which kept the patient and all the equipment dry, relatively speaking.

Water pressure dropped mid-morning when power failed at city-run water pumping stations and the flow from faucets dwindled to a trickle. Without water pressure, toilets could not refill and since most new toilets in institutions do not have tanks, there was a major problem developing. A few hours later, there was discolored water flowing from the taps, and toilets could once again be flushed. Thankfully, some years ago as part of disaster planning, a well had been dug and although “well water” was not potable or suitable for bathing babies, it certainly was adequate for showering and flushing toilets.

Methods and sources of communication varied. Local telephone service, especially for incoming calls, became very sporadic and communication with the outside world more difficult. We found that calling long distance had a higher likelihood of success than a call within the same area code. The cable company supplying the television signal failed and we were restricted to our CBS affiliate which began to give us a much skewed vision of the local outside world. There were very few radio stations broadcasting to begin with, and ultimately this dwindled to the CBS affiliate as well. Most of the information provided was anecdotal and originated from callers to the show. There were reports and then pictures of a section of Interstate 10 between New Orleans and Slidell having been washed away; meaning that any rescue personnel could not enter from the east, and evacuation in that direction would be impossible.

Our Ochsner security force amounted to thirty-six in-house armed officers. These friendly faces worked rotating twelve-hour shifts and provided the staff with as much of a sense of comfort as was possible under the circumstances. Most of us got little sleep that first night post-Katrina, and the temperature in the NICU continued to rise.

August 30: Day 1
Reports of the broken levees with subsequent massive flooding throughout the area had a major dampening effect on the optimism that many were feeling from having just survived the storm. Outside we could see the rising water level in the street, but it had not reached our front door. We were told by administration (correctly) that due to the elevation of the campus, flooding was not expected to reach the hospital. Nonetheless, there were sandbags available.

We reopened and returned to the tenth floor NICU and began to open the storm shutters. You could still hear the wind outside but the rain was limited to a passing sprinkle. While we found no broken windows, water had seeped through the windows and even in between some bricks in the wall. What is even more astounding was to find blades of grass and leaves stuck to the outside of our windows ten floors up!

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Our census grew late in the morning when there was a delivery of a near-term infant. The baby had the audacity to develop respiratory distress and subsequently required endotracheal intubation. Gowning for the placement of central lines was not much fun as the environment of our NICU was starting to feel like a typical New Orleans summertime 90-90 day (90 degrees-90% humidity). Acceptable attire in the NICU was now sandals, shorts and T-shirts.

The utility status remained unchanged as we were still using generator power, well water, and telephones (when you could connect). Due to the heat, a cold well water shower was a luxury item, but you needed your flashlight close by as most bathrooms were not on the generator circuit. The Internet miraculously continued to function with only very brief interruptions. Streaming video provided a connection to the outside world but only served to depress the morale of the team. We were beginning to see the devastation imparted by Katrina, and now we learned that there had been serious breaches of some of our lev-

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The National Guard arrived with eight soldiers to bolster our security force. Unfortunately, these eight soldiers were young and inexperienced and lacked the necessary training needed for the magnitude of the situation. The National Guard soldiers were soon dispatched to the city. Due to social unrest in the downtown section of New Orleans and reports of looting in hospitals, Ochsner went into a “lock down” mode after dark and maintained security guards at all entrances. With minimal fire protection available, everyone was repeatedly cautioned about the use of anything flammable.

By early evening, the temperature in the NICU was now above 95 degrees. Due to the humidity, any item which was stuck to the wall with tape soon found its way to the floor. While other areas of the hospital were slightly air conditioned, the general activity of all the health care workers and equipment kept our area from ever feeling any flow of air; not even warm humid outside air. The building is designed, like many others, for air conditioning, so windows do not open. Floor fans helped but could not improve the environment sufficiently for our patients. Soon the babies began telling us that the situation was becoming intolerable. Sponge baths were not feasible due to the unknown elements in the well water. The baseline body temperatures of the babies began to rise despite being clothed only in diapers. Many of the babies became increasingly irritable and then feeding-intolerant. Shortly thereafter, we were informed that due to the heat and a lack of fresh water, the analyzers in the lab were shutting down. We were then limited to bedside point-of-care testing only.

I met with our NICU staff and made the difficult decision to begin evacuation proceedings. We were tasked with moving twenty-six babies to safer situations, which meant placing our babies and others at risk but less risk than not moving. After more than three decades of being known as an NICU that accepted all ill newborns, we were faced with a large scale evacuation. As the message circulated that we were looking for help, the phone began to ring and many of the friends whom we had helped over the years were anxious to return the favor. Teams from as far west as Houston and as far east as Birmingham and many places in between were making plans to send physicians, nurses and neonatal nurse practitioners to rescue our little patients. (see Baldwin, Distefano, Spedale) Due to limited ability to communicate with our patients’ parents, when unable to contact them, we used the face sheet in each patient’s chart, and determined whether to send the patient to a level III NICU east or west from New Orleans. Teams from Birmingham, Baton Rouge and Houston arrived by fixed wing, helicopter or ambulance that night, and none of the crews left empty-handed. (figure 1) After experiencing the conditions that we had been working through, each of the teams vowed to return. The majority of our babies were transported to safety on this Day One. With the skies over New Orleans having been commandeered by the Federal Emergency Management Agency (FEMA), this took much more coordination than any transports we had ever arranged.

August 31: Day 2
True to their words, every transport team returned today. Upon their return, our staff was treated to ice chests full of cold drinks and chocolates, and one team even brought us T-shirts with their group’s logo. Their generosity struck us all deeply and brought many to tears. By midday, the only remaining patient was our baby requiring ECMO. (Figure 2) Many of our nurses were requested to assist in other areas of the hospital while discussions began regarding the downsizing of our staff.

One of the generators had an electrical failure so we were now down to two functioning sources of power. The temperature in the NICU remained above 90 but was a bit more tolerable owing to the lack of activity. Due to the restrictions from lack of laboratory support, other areas of the hospital also found it impossible to care for their sickest patients and a limited evacuation of these patients took place during the day. With the help of our biomedical department, we evaluated the NICU from an electrical standpoint and found that the heat and humidity kept the monitors from functioning properly, which made returning to the tenth floor impractical.

Voice communication continued to be difficult. Landlines had collapsed, and cell phones became largely inoperable due to tower failures. We learned that the success rate of communicating with the outside world was much higher using text mes-
saging than with a phone call. Surprisingly, the Internet stayed functional throughout the storm and aftermath. Not only could we get messages out, but also streaming video gave us a glimpse of how post-Katrina New Orleans and the Gulf Coast appeared. The levee breaches were extensive and flooding of homes horrific. Most of us were speechless while watching the unimaginable and seeing the despair. Some of the staff had not heard from loved ones for days. Between what we saw and heard (or in some cases did not hear), the staff began to need each other more than ever. Most of us found it close to impossible to sleep that night due to accommodations as well as the psychological effect the storm and its aftermath were having on us.

September 1: Day 3

With the population in the NICU reduced to our lone ECMO patient, we were able to allow for the departure of over 50% of our staff. Enough personnel were kept on campus as we were unsure of when utilities would return—making the keeping of patients possible once again. With the very limited and sometimes terribly inaccurate information provided by the news media, most did not wish to leave alone. Caravans of cars and buses were scheduled and departed at specific times. As we learned that travel to the east was impossible, only leaving to the west and north was feasible. Caravans headed toward Baton Rouge and had little difficulty reaching their destination though reports of scattered debris never did justice to seeing the destruction first-hand.

Emotions were overflowing as many felt they were leaving one family in search of another. By now, the satellite photographs were becoming available on the Internet. With enough perseverance, neighborhoods and individual homes could be identified. For those of us remaining, the next wave of emotions hit. Some of us found our homes seemingly unscathed while others discovered severe damage and flooding.

From an institutional standpoint, the generator that failed was brought back on line when the part and technician were helicoptered from Alabama. It did not make a noticeable difference in the section of the hospital where our patients had resided. The well water continued to serve its purpose and as long as the Internet functioned, communication was still readily available. Instant messaging was a valuable tool to have at one’s disposal. Some phone service was returning, but it still worked best when calling areas outside of the local area code. Our security team was supplemented by twenty-three out-of-state contract officers.

Food and nutrition services re-established their supply chain as shipments of food and dairy arrived from Dallas and Baton Rouge respectively. We discovered how talented one member of our house staff really was when he volunteered to operate a forklift in order to unload a food shipment. Other staff physicians became food servers in order to give the dietary staff a well-deserved break. By now the dietary staff had truly risen to the top of the food chain (pun intended) as during peak times they demonstrated the ability to feed up to 1500 people within thirty minutes.

Our “B” team assembled in the Ochsner Clinic in Baton Rouge. This center became the peripheral command site which coordinated physician staffing, housing and transportation to the New Orleans Hospital and Clinic. The “B” team traveled in caravans utilizing buses and private cars from Baton Rouge to New Orleans during daylight hours with National Guard escort. Their arrival was just what the members of the “A” team needed.

September 2: Day 4

At 10:30 AM we had normal power restored to the campus when the first feeder line from Entergy was connected. By late in the afternoon, you could feel the heat and humidity dropping. As the day went on, there were more fresh faces appearing by the hour, and few members of the “A” team remained. For dinner that night, the Clinic and Hospital administration held a barbeque. This provided a welcome relief from cafeteria style and canned food that had sustained us for the previous five days. Just the smell of burning charcoal was worth the trip to the parking lot where the small crowd of 2500 was being fed. No one complained about the wait.

September 3: Day 5

Our first post-Katrina baby was delivered weighing 683 grams (1 pound, 8 ounces) and brought a new sense of life to our NICU. With the air conditioning returning to the facility we were able to care for her. The patient did well, and she was discharged home in early December.

September 4: Day 6

We began calling the staffs of all hospitals that referred babies to us pre-Katrina to inform them that we were fully staffed and operational. We had also recovered the use of our helicopter and air space as FEMA would now allow us to fly in the area. We made a decision not to back transfer patients to our institution as few of our families had yet been able to return.

September 9: Day 11

City water returned, and it was refreshing to see something colorless flowing from the faucets. Everyone was cautioned about drinking the water for the first twenty-four hours as there may have been breaks in the continuity of the underground pipes. The city wanted to be sure that the system had been cleared of any potentially contaminated water, which may have been sit-

Continued on p. 22
ting in the system for the last week and a half.

Feeding and watering of the troops had been flawless. Not only did the Food and Nutrition staff care for the patients, families and staff, but they also fed the National Guard, Security Staff and FEMA workers, who had set up a mobile clinic in front of Ochsner. As part of the meals served, the staff and visitors had consumed 36,000 tomatoes, 7,000 melons, and 10,000 apples. Bottled water and sports drinks totaled 45,000 served.

September 22: Day 24
After hearing about Hurricane Rita’s possible landfall in northeast Texas, an evacuated New Orleans family (currently residing in Houston) requested the transport of their premature twenty-nine week twins. We returned the favor afforded to us previously by Houston’s neonatology staffs and were able to charter a jet to evacuate these babies and bring them closer to home. These babies brought our census to ten patients, which was about one-third of the norm.

Current Status
By early December, our NICU census had grown to 35 babies. Our obstetric staff has expanded as we have accommodated some of our area’s displaced physicians. With the expected increase in the number of NICU patients, we have recently petitioned the State of Louisiana for the licensing of additional beds at our institution.

The baby that stayed with us in his own private NICU while on ECMO is now home and doing well.

LESSONS LEARNED AND FUTURE ACTIONS PLANNED
Our institution has addressed many of the infrastructure issues that Katrina raised. The following changes are being added as we update our Emergency Management Manual.

Power
- Move above ground feeder lines provided from Entergy as below ground lines may be unreachable.
- Although we had three generators, they were insufficient to carry the air conditioning to parts of the institution, and this is being resolved with the purchase of a fourth generator and the possibility of adding two portable generators for additional air conditioning support.

Water
- Backup well water pump motor purchased.
- Fresh water storage tanks being fitted for more pumping capacity.
- Installation of a pump, which is capable of pumping fresh water out of bulk tanker trucks, has taken place.

Sewage
- Purchase gas-fired sewage ejection pumps if power to city pumping station fails.

Communication
- External: Evaluate the use of satellite phones.
- Internal: More SpectraLink phones, which would be assigned by function and not person.
- Command center: To be established for preparing a list of functions and scheduling meetings.

Laboratory
- Waterless analyzers are currently available and are being considered for purchase.

Security
- Perimeter fencing with lock down gates to be considered.
- Need National Guard presence sooner.

COMMENTS
Unfortunately, there will be future Katrinas. Whether they are natural or man-made, catastrophes will not be as important as how we as a society prepare, cope and respond. The decision to evacuate a patient should be based on the expectation of the magnitude of the impending disaster, the institution’s ability to handle its patients, families and medical personnel during and after the catastrophe, and understanding what the local surroundings may be like throughout the aftermath. No one person or institution will be able to anticipate and respond to every challenge that awaits those who attempt to weather the storm. Indeed, no one geographic area has the capacity to provide hospital care to children in a major disaster. By planning ahead, being able to respond quickly to a changing set of circumstances and learning from others’ experiences it is possible to create an environment which will allow for a successful outcome from a seemingly hopeless situation. No doubt we will be judged by our actions during a crisis situation with ramifications likely being long lasting. Once the immediate threat has passed, the continuation or restoration of patient services requires planning, leadership, patience, flexibility and commitment.

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