

Neonatal Intensive Care Unit (NICU) Evacuation Guidelines

A guide to assist NICU Professionals and Emergency Planners
in their planning and preparation for evacuations



ILLINOIS EMERGENCY MEDICAL SERVICES FOR CHILDREN

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Elisabeth Weber, RN, MA provided consultative services to this project and was instrumental in facilitating meetings, conducting the literature search and drafting portions of the guideline content.

In addition, contributions have also been made by various hospital emergency preparedness and safety staff who have reviewed and commented on draft versions of this document.

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NEONATAL INTENSIVE CARE UNIT (NICU) EVACUATION GUIDELINES

A Guide to assist NICU professionals and Emergency Planners
in their planning and preparation for evacuations

Definitions

This section contains definitions of disaster preparedness terms and acronyms that are utilized in this document.

ASPR- Assistant Secretary for Preparedness & Response

Capability, Surge: The ability to manage patients requiring unusual or very specialized medical evaluation and care. Surge requirements span the range of specialized medical and health services (expertise, information, procedures, equipment, or personnel) that are not normally available at the location where they are needed (e.g., pediatric care provided at non-pediatric facilities or burn care services at a non-burn center). Surge capability also includes patient problems that require special intervention to protect medical providers, other patients, and the integrity of the medical care facility. (*HICS Glossary & Guidebook, 2006*)

Capacity, Surge: The ability to evaluate and care for a markedly increased volume of patients—one that challenges or exceeds normal operating capacity. The surge requirements may extend beyond direct patient care to include such tasks as extensive laboratory studies or epidemiological investigations. (*HICS Glossary & Guidebook, 2006*)

Hazard Vulnerability Analysis (HVA)/Assessment: A systematic approach to identifying all hazards that may affect an organization and/or its community, assessing the risk (probability of hazard occurrence and the consequence for the organization) associated with each hazard, and analyzing the findings to create a prioritized comparison of hazard vulnerabilities. The consequence, or “vulnerability,” is related to both the impact on organizational function and the likely service demands created by the hazard impact. A hazard vulnerability assessment is the outcome of the HVA process. (*HICS Glossary & Guidebook, 2006*)

Hospital Incident Command System (HICS): The Hospital Incident Command System (HICS) is a management system based on NIMS that consists of a flexible organization structure and time-proven management principles. The system includes defined responsibilities and reporting channels and uses common language to promote internal and external communication and integration with community responders. HICS can be utilized for emergency incidents or for planned events. (*HICS Glossary & Guidebook, 2006*)

Incident Command System (ICS):

- A standardized on-scene emergency management construct specifically designed to provide for the adoption of an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents. It is used for all kinds of emergencies and is applicable to small as well as large and complex incidents. ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations. (*NIMS*)
- A standardized on-scene emergency management concept specifically designed to allow its users to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. (*NIMS*)

National Incident Management System (NIMS): A system mandated by Homeland Security Presidential Directive “Management of Domestic Incidents” (HSPD-5) that provides a consistent nationwide approach for Federal, State, local, and tribal governments, the private-sector, and nongovernmental organizations to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. To provide for interoperability and compatibility among Federal, State, local, and tribal capabilities, the NIMS includes a core set of concepts, principles, and terminology. HSPD-5 identifies these as the ICS; multiagency coordination systems; training; identification and management of resources (including systems for classifying types of resources); qualification and certification; and the collection, tracking, and reporting of incident information and incident resources. (*NIMS*)

Preparedness:

- The phase of Comprehensive Emergency Management that encompasses actions designed to build organizational resiliency and/or organizational capacity and capabilities for response to and recovery from disasters and emergencies. (*adapted from the VHA Emergency Management Guidebook, 2005*)
- Activities, programs, and systems developed and implemented prior to a disaster/emergency that are used to support and enhance mitigation of, response to, and recovery from disasters/emergencies. (*NFPA 1600, 2004*)
- The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness is a continuous process. Preparedness involves efforts at all levels of government and between government and private-sector and nongovernmental organizations to identify threats, determine vulnerabilities, and identify required resources. Within the NIMS, preparedness is operationally focused on establishing guidelines, protocols, and standards for planning, training and exercises, personnel qualification and certification, equipment certification, and publication management. (*NIMS*)

Introduction

Disasters can strike at any time and lead to extended operations/service interruptions, unstable infrastructures and/or catastrophic devastation. In a traditional sense, healthcare facilities are viewed as sources of medical care to disaster victims. However, these facilities may also become victims of disasters. When standards of patient care cannot be met or the safety of the hospital infrastructure is compromised, the need to evacuate and transfer patients to other facilities may be necessary. The evacuation of any patient population is a challenging activity, however the mobilization and evacuation of our tiniest and most fragile patients – those in the Neonatal Intensive Care Unit – is a high risk activity. Evacuation requires a carefully planned approach due to the fragile medical condition of these infants, the various medical technology/devices they depend upon for survival, and the overall surge capacity/regional transfer patterns when managing an increase in the neonatal patient population.

In an effort to provide statewide guidance to Illinois hospitals on the evacuation of this population, the Illinois Emergency Medical Services for Children brought together Neonatal Intensive Care Unit (NICU) professionals from throughout the state to assist in the development of a set of evacuation guidelines. A multi-disciplinary committee was then convened to collate personal experiences, recommendations and current literature on NICU evacuations, resulting in the development of this guide.

This guide was prepared through a collaborative effort to assist healthcare providers assess pre-event vulnerabilities and plan for the evacuation of medically fragile Level III NICU patients while addressing core components of incident management, in conjunction with the promotion of patient safety and evacuation procedures based on lessons learned from past disasters and experiences.

An extensive literature search was conducted for this project (see Annexes L and M). The literature clearly emphasizes the importance of pre-event planning for the mobilization of the NICU population. A central command system is essential in minimizing potential chaos associated with any evacuation. It is the recommendation of the committee members authoring this guide that all NICU nursing and medical leadership staff follow the National Incident Command System (NIMS) and Hospital Incident Command System (HICS) guidelines to coordinate a well orchestrated management approach for any incident or event, assist in resource allocation, and develop consistent patient tracking processes. It is highly recommended that leadership staff complete FEMA training courses IS 100HC, IS 200HC and NIMS 700. Visit <http://training.fema.gov/IS/crslist.asp> for online course listings.

A common thread among the lessons learned from Hurricanes Katrina and Rita include deficient planning related to communication systems. It is recommended that facilities plan for communication redundancies that include various technologies such as cell phones, 800 MHz radios, walkie-talkies, and wireless phones. Further, emergency or disaster plans should include training on all alternative communication methods for all staff who will be involved in incident management. Emergency communications can be hampered when staff members are not familiar with use of communication equipment in the midst of a time sensitive evacuation. An evacuation incident is not the time to learn how to use these devices!

Due to the inherently fragile condition of NICU patients, team leaders must consider staff needs during an evacuation event. It is recommended that a strategic use of flow be utilized when mobilizing these tiny

patients. The order of evacuation should be based on the type of disaster and whether the evacuation must occur immediately due to a fire, loss of power or lack of building structural integrity as opposed to a planned evacuation such as with a weather emergency that may allow a more controlled patient evacuation process. Several authors (Bernard et al (2008), Bowers et al (2004), Cocanour et al (2002)) recommend that the sickest intensive care patients be moved first because they require more time and use more energy, thus rapidly consuming supplies and staff. One author, Franck et al (1993) recommends that the least sick should be evacuated first. It is prudent to begin evacuation procedures when staff is available and has high levels of stamina. It is important also to remain cognizant of staff stress and fatigue as the evacuation progresses. If the evacuation is the result of a large scale and complex event or disaster, healthcare facilities need to strategically account for the number of NICU trained staff that will be needed. Hospital plans should include written processes for coordinating efforts with the incident management staff and the assignment of evacuation roles to ancillary staff to assist with non-clinical tasks to mobilize NICU patients.

In addition to staff needs, NICU incident management leadership staff should be aware of the rapid depletion of supplies that may occur as supplies are moved with the NICU patient. In the event that supplies or equipment cannot be replenished, staff may need to improvise. It is important that NICU staff become familiar with non-traditional methodologies to assist equipment dependent neonates. A back-to-the-basics approach without the aid of technology may prove challenging to novice nurses. Patient ventilation techniques using intermittent positive pressure breathing machines, monitoring electrocardiograms of unstable patients using defibrillators, titrating IV rates using IV flow-rate devices, using PDA's and cell phones as light sources and using piston syringes for suctioning are a few examples used by staff during past evacuations. All equipment needed for an evacuation should be strategically placed where it can be retrieved at a moment's notice.

Depending on the immediacy of the evacuation, NICU staff should maintain paper records for the neonates being evacuated to other facilities. Given the circumstances, it may not be feasible to obtain access to electronic records or complete medical charts.

Patient tracking and transport needs prove to be a challenge during an evacuation. Lessons learned from Hurricanes Katrina and Rita emphasizes the need for community-wide planning. Hospital plans should include a comprehensive emergency management strategy rather than a hospital-centric focus. Consider executing Memorandums of Understanding (MOU) with private ambulance agencies, critical care aeromedical transportation providers, bus companies, and other transportation agencies that, although not conventional, may render services when medical transport vehicles are unavailable. Keep in mind that during a disaster, other forces may be competing for these same resources. The pre-planning process should also include the development of an inter-state hospital network. In other words, know neighboring hospitals with NICU capabilities within your state and in border states and have ready access to their contact numbers. It has been proven in past disasters that communities do come together and assist those who are vulnerable and at high risk. Use the pre-planning phase to build relationships within your community.

A NICU evacuation can cause high levels of anxiety for the parents of the fragile patient. Develop processes for keeping the family informed of their infant's condition and relocation destination. An influx of inquiries from family members can create an undue burden on NICU staff who may be already overwhelmed with

the mobilization process. It is recommended that all staff, including physicians, understand their role in the evacuation process and that a designated staff member be assigned as a parental liaison.

The Illinois NICU Evacuation Planning Committee has reviewed the contents of this guide and strongly recommends that NICU staff work collaboratively with their community, neighboring healthcare providers, emergency managers and other personnel within their hospitals to develop a neonatal evacuation plan that enhances safety and assists in reducing morbidity and mortality.

How to Use this Guide

This guide was prepared to assist NICU staff develop an evacuation plan for mobilizing medically fragile and technology dependent infants. The purpose of the guide is not to be used as the hospital's evacuation plan during the actual event. Rather, the content of this guide aims to assist NICU staff in the pre-planning phase by providing recommendations and education needed to prepare an evacuation plan.

The evacuation of an entire NICU is rare. However, a successful evacuation requires comprehensive planning in order to maximize patient safety in a changing environment. Our state is no stranger to natural disasters. Over the years, we have encountered tornados, winter storms, flooding and earthquake incidents which can lead to interruptions in hospital services. A total or partial evacuation may also be authorized when the hospital site can no longer sustain an adequate standard of care whether caused by natural phenomenon or by manmade disasters.

Use this guide to prepare for infant evacuation activities and triage. Planning and education are of the utmost importance in managing disasters/incidents. In addition, include regular drills and exercises as part of your hospital's emergency preparedness program.

Planning Assumptions

These guidelines are intended for use by facilities with a Level III Neonatal Intensive Care Unit and are based on several assumptions as outlined below.

- There is recognition that disaster plans for children should include regional capacity and the likelihood that children may have to be moved a significant distance to assure proper care (Johnston, C, 2006).
- The hospital providing neonatal intensive care services is National Incident Management System (NIMS) compliant.
- The hospital has an evacuation plan or annex which describes basic concepts of evacuation, including limited/partial evacuation to full patient evacuation.
- The hospital evacuation plan describes selected responses ranging from an immediate to a planned evacuation based the most likely hazards facing the hospital per a Hazard Vulnerability Analysis (HVA).
- These guidelines are based upon and extend from Assistant Secretary for Preparedness and Response (ASPR) FY08 deliverables which require participating hospitals to have written plans to address medical evacuation and which include at minimum current information on: (a) personnel training in evacuation procedures; (b) transportation means, equipment, supplies, and alternative facilities, and, (c) the operational structure and standard operating procedures for moving patients as appropriate.
- These guidelines reflect the Joint Commission 2009 Emergency Management Standards
- These guidelines were developed assuming that a full evacuation of patients was necessary with little time for planning at the time of the evacuation and that only the staff on duty in the hospital would be available to assist with the evacuation.
- These guidelines would be used most efficiently as a pre-planning tool rather than during the response phase of emergency management.
- These guidelines include annexes of supporting information, forms and documents, and recommended supplies, and were developed by workgroup members and provided for use by all.

NICU Evacuation Components

PERSONNEL

Describe NICU specific tasks and job actions during an evacuation for the following NICU based staff members:

- NICU Charge Nurse/Manager in conjunction with the Neonatologist - Utilizes the Job Action sheet “Team Leader-Neonatal Intensive Care” [Annex J], uses the HICS Form 260 [see Patient Evacuation Tracking Form in Annex F], requests additional staff from the Labor Pool, is aware of number and acuity of patients and transportation required, and designates a person to record the location and destination of patients
- Neonatologist/Fellow/Medical designee - Works with NICU Charge Nurse as Team Leader to determine triage priorities, recognizing that the literature shows that sicker patients require more time and use more energy; to conserve supplies and staff consider that sicker patients may need to be moved first, which is the opposite of standard evacuation principles

- Advanced Practice Neonatal Nurses/Resident Physicians –Prepare medical record summaries for evacuation or transport
- RNs/LPN’s (Working in teams with one leader for every five co-workers if possible) - Prepare patients for transport using identification and supply and equipment recommendations as detailed in this document
- Respiratory Therapists - Assure that the hospital plan includes responsibility for bringing O₂ cylinders to NICU or determine who is responsible
- Clerical Staff –Prepare transfer documents, including a Demographic/”Face Sheet” as directed by Unit Team Leader [*It is recognized that patient chart formats may differ depending on whether an electronic medical record is available; as much clinical data as possible should be provided upon evacuation with the minimum data to include recent progress notes, vital signs, medication records and any additional clinical data, such as laboratory testing results and radiology results if time allows*]
- Support Staff such as Technicians, Nursing Assistants, Students etc. - Work under the direction of the Unit Team Leader
- Following personnel based on time of day and availability to unit: Pharmacy, Social Work, Clinical Engineering, Transport Team
- Any additional unit personnel onsite should report to Charge Nurse/Team Leader

Describe evacuation tasks for non-NICU based staff including but not limited to:

- Central Supply
- Clinical Engineering
- Facilities management
- Hospital volunteers
- Housekeeping
- Pharmacy
- Patient Transporters/Escorts [Intra-facility]
- Transport Team if available on site [Inter-facility] *Recognize that in a full evacuation, Transport Team personnel may be a resource assigned by the Incident Commander*
- Social Work

Consider Security (Include Security escort for patient, staff, and equipment)

Communicate messages via the HICS 213 [see Incident Message Form in Annex G] if possible to assure clarity of communication and incident tracking capability. If a 3 ply form is available, one remains with patient or staff member, one is given to runner/transporter, and one is available for Incident Command Center

- Add copies of HICS 213 [Annex G] to Evacuation Bags as a resource
- Utilize HICS 260 [Annex F] and HICS 213 [Annex G] during drills

TRAINING

Determine the extent of hospital based employee training when designing NICU training.

If the hospital does not include training in the following topics, then add:

- **Importance of wearing hospital identification during an emergency**
- Importance of assuring that non-NICU staff and non-clinical volunteers are wearing proper identification; and clinical staff is credentialed through a hospital process
- ‘All Hazards Planning’ to include Incident Command/HICS, hierarchy of roles and chain of command topics
- HICS training for managers and needs awareness training for staff to include where and when to report to hospital if off site when emergency occurs
- Training/education regarding designated parking locations, hospital entrances, labor pool site and check-in process during disasters
- Enhancement of call tree to sort by staff address and proximity to hospital (see Annex H)
- Plan to include staff participation in hospital drills so that NICU evacuation specific challenges are included
- A discussion of the possibility of two types of evacuations—an initial evacuation to a safe place, commonly known as a *Staging Area* within the hospital or at a local hospital without NICU services; then a secondary transfer to care at an appropriate facility
- Alternate communication modes available to staff (radios, walkie-talkies, satellite phones, in house wireless communication devices, cell phones [hospital or personal], voice over internet etc.)
 - Provide regular training on all modes of communication (i.e., know how to use radios, walkie-talkies, in house wireless devices etc.)
 - Train staff to use the appropriate radio frequencies designated for hospital disaster use
 - Know hospital dead zones for cell phones, radios, and walkie-talkies, in house wireless devices
 - Use clear language – avoid code and industry specific nomenclature
- Recommendation that staff plan for at least four days (96 hours) of personal supplies (clothing/toiletries/and medications if applicable)

Include the following in NICU Evacuation Training:

- Options and methods to identify unit based leaders during an evacuation or incident to include use of hats, large ID tags, vests/ shirts/sashes—whichever method is chosen should be consistent throughout hospital and be utilized for every drill [This is especially important when non-NICU staff or volunteers are included in an evacuation and who do not know the leaders by name or by reputation]
- Evacuation routes from unit to Staging Area and outside hospital (destination to be determined when scope of the evacuation is identified)
- Review of evacuation bag contents and storage locations
- Review method of designating when a patient care room is empty/cleared (signs, ribbons, or tape based on hospital emergency management plan)

- Use of NICU Team Leader Job Action sheets, HICS 260 [see Patient Evacuation Tracking Form in Annex F] and HICS 213 [see Incident Message Form in Annex G]. Include in evacuation bags and in departmental disaster plans or charge nurse resource binder
- Method to document patient tracking and family notification/family reunification based on hospital emergency management plan
- Method used to categorize patients for evacuation based on hospital emergency management plan
- A communication directory to the command center and other important contact phone/pager numbers to be maintained in departmental disaster plan
- Knowledge of hospital specific communication/pager dead zones and planning for alternate forms of written or verbal communication via runners
- Reporting of pertinent drill findings and available After-Action Reports (use HSEEP – Homeland Security Exercise and Evaluation Planning format).
- Adding a coaching component to hospital drills

STAFF ROLES AND RESPONSIBILITIES

Daily Task:

- Each unit staff member should know their role and responsibility during their shift if an evacuation were to occur

Monthly Task:

- Check evacuation bags including lock integrity of bedside evacuation bags/boxes
- Assure location and integrity of evacuation supplies at pod/unit level (storage determined by individual hospital capability; write location of supplies into plan)

Quarterly Tasks (or when information changes):

- Update NICU call tree with all NICU staff described in personnel section (see Annex H for sample form)

TRANSPORTATION

- Access needed transportation through the hospital based Incident Command process, recognizing that this will most likely be organized regionally using available local and regional assets
- Recognize that aircraft and emergency medical service vehicles contracted by the Transport Team, if usually available, may become a regional/federal asset and will not be available to the NICU for deployment
- Be aware of any Memorandums of Understanding (MOU) for transportation
- Be aware of the hospital based transportation resource inventory (vehicles, vans, receiving dock vehicles, ambulances etc.)
- Use relay system (stationing staff at intervals along the evacuation route) if regular transport beds are used
- Take chart records and maintain with patient

FAMILY NOTIFICATION

- Notify family as soon as possible
- Assign family liaison position to keep families apprised of patient transfer status and location. Note: it is important to coordinate this information with the Public Information Officer (PIO).
- If applicable or necessary, have ready access to all pertinent transfer consent forms

EQUIPMENT

- Utilize HICS 260 [see Patient Evacuation Tracking Form in Annex F] to document all equipment transported with the neonate
- Know battery life/promote extension of battery life by plugging in electrical equipment
- Charge all equipment in emergency outlets if power is available while preparing for evacuation
- Consider bed batteries as back up
- Consider purchase of back up batteries for equipment and a method to assure charging capabilities and testing based on recommendations of manufacturer or hospital based Biomedical/Clinical Engineering
- Syringe pumps
- Drug box/Transport bag/Organized supply kit, i.e., Kangaroo Board™
- Airway bag and supplies
- O₂ source and supplies
- Portable Suction Equipment
- Consider taking a Crash Cart if going to a non-clinical Staging Area on a horizontal move
- Consider additional hospital locations of NICU Crash Carts that could easily be moved to the designated Staging Area (i.e., additional NICU Crash Cart maintained in an Outpatient OB setting or Emergency Department)

SUPPLIES

- **Identify infants in multiple ways:** Consider both standard ID bands/ID stickers on diapers/attached medical equipment, as well as direct patient marking. Utilize a surgical marking pen or waterproof marker to write on a transparent dressing that is then applied to the skin of the neonate. Utilizing a dressing avoids the possibility of tattooing on very low birth weight infants. The preferred location for this transparent dressing is the abdomen, with other skin sites considered when the abdomen is not intact and there is an alternative site on the neonate's body that can accommodate the dressing.
- The transparent dressing (as described above) that is placed directly on the infant should ideally contain the same information as the ID band/ID sticker: the name of the infant, the date of birth, medical record number, and Mother's name, if readily available.
- Determine whether evacuation boxes or bags/backpacks are the most appropriate transport method based on unit storage capability and previous hospital planning
- Place content stickers in and on evacuation boxes/bags and in policy and secure with breakaway lock or closures (See Annex E)
- Assure that all bags can accommodate even very low birth weight infants (under 1000 g).
- Have one supply bag/box per patient per room (supply amount should be enough for a minimum of 4-6 hours)

- Move all available supplies and medications with the neonate; be cognizant that the receiving hospital/staging area may not have the needed supplies or medications immediately available
- Plan for pod/unit based evacuation bags with supplies for all patients (See Annex D)
- Store supplies in a low position for easy access if possible and in ante rooms for patients in isolation to prevent contamination of supplies
- Consider how to transport dietary needs/breast milk for patients
- Take existing and available medications along with Med Boxes if available
- Bring Hats/Blankets/Thermoregulatory Methods
- See Annexes D and E for suggested evacuation bag/box contents

EVACUATION EQUIPMENT

- Recognize that there are multiple types of evacuation equipment made specifically for neonates.
- Purchase and drill with evacuation supplies and equipment so that staff become familiar with their use
- Members of the Committee that developed this guide can be contacted to share specific equipment purchased for their hospitals

Operational Structure/Standard Operating Procedures

Consider Surge Capacity of NICU as well as Surge Capability of regional hospitals based on number and acuity of patients and transport route, including how many patients can be transported in one trip.

COMMUNICATION

During an actual evacuation, action plans should be made by the Unit Team Leaders and communicated to all staff on site

- Recognize that communication from care provider to care provider is the ideal tool for communication hand off, i.e., SBAR (**S**ituation; **B**ackground; **A**ssessment; **R**ecommendation)

Communicate messages via the HICS 213 [see Incident Message Form in Annex G] if possible to assure clarity of communication and incident tracking capability. If a 3 ply form is available, one remains with patient or staff member, one is given to runner/transporter, and one is available for Incident Command Center.

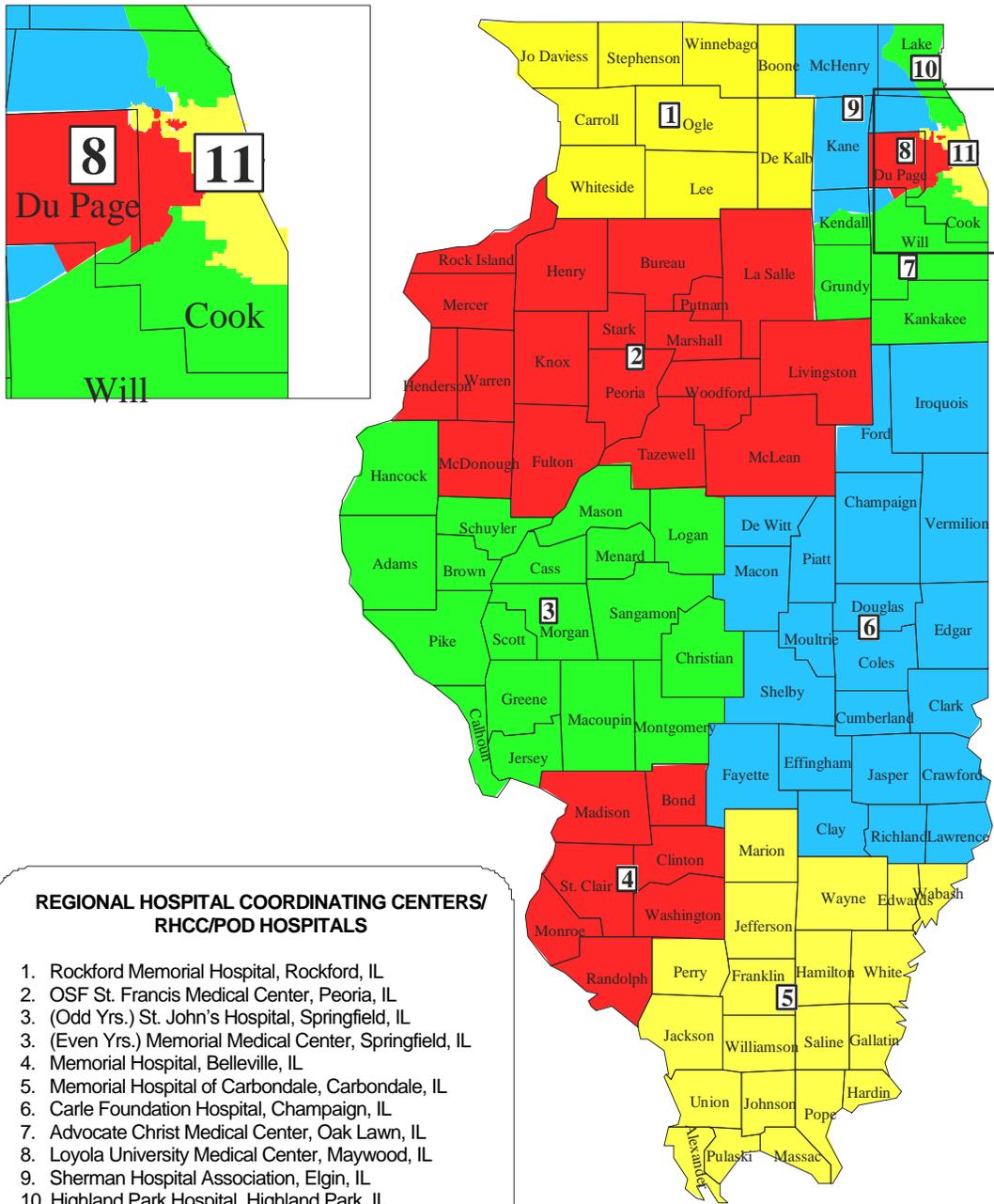
- Add copies of HICS 213 [Annex G] to Evacuation Bags as a resource
- Utilize HICS 213 [Annex G] during drills

RECEIVING HOSPITAL

- Receive patient into facility. Transfer of plan of care via communication hand-off.
- Assign a family liaison position to notify family as soon as possible regarding condition of the infant and arrival at their facility. Instruct family on communication and visitation process. Note: it is important to coordinate this information with the Public Information Officer (PIO).

ANNEX A: ILLINOIS EMS MAP

Illinois Department of Public Health Emergency Medical Services Regions



ANNEX B: ILLINOIS LEVEL III NICU BED COUNT (FEBRUARY 2009)

EMS REGION	HOSPITAL NAME	CITY	LICENSED NICU BEDS	TOTAL REGIONAL NICU BED COUNT
1	Rockford Memorial Hospital	Rockford	44	Region 1 = 44
2	OSF St. Francis Medical Center	Peoria	47	Region 2 = 47
3	St. John's Hospital	Springfield	40	Region 3 = 40
6	Carle Foundation Hospital	Urbana	25	Region 6 = 25
7	Advocate Christ Medical Center	Oak Lawn	37	Region 7 = 37
8	Central DuPage Hospital	Winfield	8	Region 8 = 94
	Edward Hospital	Naperville	12	
	Advocate Good Samaritan Hospital	Downers Grove	11	
	Adventist Hinsdale Hospital	Hinsdale	13	
	Loyola University Medical Center	Maywood	50	
9	Advocate Lutheran General Hospital	Park Ridge	54	Region 9 = 63
	Rush Copley Memorial Hospital	Aurora	9	
10	Evanston Hospital	Evanston	40	Region 10 = 40
11	Advocate Illinois Masonic Medical Center	Chicago	20	Region 11 = 363
	Children's Memorial Hospital	Chicago	40	
	John H. Stroger, Jr. Hospital of Cook County	Chicago	52	
	Mt. Sinai Hospital Medical Center	Chicago	35	
	Northwestern Memorial Hospital	Chicago	86	
	Rush University Medical Center	Chicago	57	
	University of Chicago Medical Center	Chicago	47	
	University of Illinois Medical Center at Chicago	Chicago	26	
Missouri	Cardinal Glennon Children's Hospital	St. Louis, MO	60	151
	St. Mary's Health Center	St. Louis, MO	24	
	St. Louis Children's Hospital	St. Louis, MO	67	

TOTAL LICENSED NICU BEDS: 904
(753 IN ILLINOIS + 151 IN ST. LOUIS, MISSOURI)

ANNEX C: NICU DISASTER PROTOCOL ADVOCATE CHRIST MEDICAL CENTER, OAK LAWN, IL AUGUST 2008

PURPOSE

In the aftermath of recent natural disasters, and the continued threat of terrorism in the world today, the need for an evacuation plan specific to the NICU is critical. NICU nurses must be prepared to safely evacuate medically-fragile, premature infants in a well-organized systematic manner, to ensure the best outcome for our high risk patients.

EMERGENCY EVACUATION MANUAL

This manual will be located behind the secretary's desk with the other reference manuals. The contents will include:

- Code Purple Policy
- List of departmental phone numbers
- List of area nurseries/NICUs
- Location of emergency vests
- Location of evacuation bags (with list of items in bag)
- Evacuation routes
- Location of emergency equipment (pulse oximeters (e.g. Massimo™) for transport, phones (e.g. Alcatel™) and evacuation vests)
- Responsibility list
- Evacuation Log

EVACUATION INITIATION

At the first indication of a disaster, electrical power or medical failure the Charge RN will notify the MCO, Nursing Directors and Medical Directors in charge, who will initiate a code purple. Staff RNs, Neonatologist, respiratory therapy, security, building operations are subsequently notified. (See CMC Code Purple: Evacuation Plan; 01.062.305 for ancillary staff's specific duties in an evacuation.) If conditions present an immediate danger, associates may relocate patients and visitors to another area of the building without prior approval.

Type of disaster will determine if an internal or external evacuation will be initiated.

- **Horizontal Evacuation:** Consider this first. A site adjacent to the fire or emergency, but beyond the firewall; move patients away from the area of the emergency; keep infants on unit if possible, close fire doors and contain.
- **Vertical Evacuation:** Do not use elevators if fire or explosion, may need to evacuate down ramps or stairs - this will determine how to transport infants (isolettes, cribs, carried).

TRANSPORTING INFANTS

Evacuation order

- Least acute move first. Evaluate based on situation.
- If infant too critical to move, must remain in NICU.

Horizontal move

- Move in cribs or isolette, (co-bed as a last resort, but infant must be properly identified first). Can also apply to vertical move if elevators can be used.

Vertical move

- Emergency vest
 - Can not use pockets in back because we can not see infant - put infant in front 2 pockets and put charts in back pockets.
 - If necessary, can also carry two infants in addition to infants in vest pocket.

STAFF RESPONSIBILITIES

CHARGE RN

- If nature of emergency dictates, shut off O₂ main valve.
- Notify staff of impending evacuation.
- Work with Neonatologist to determine the order of evacuation.
 - most stable infants are evacuated first
 - if infant is too critical to be moved they must remain in NICU
- Assign duties to staff to avoid duplication of tasks.
- Once unit is evacuated, account for all patients using current census report and evacuation log.
- Facilitate communication between ancillary staff, NICU staff and HICS.

STAFF RN

- **IDENTIFY PATIENT**
 - Infant ID band/blood band on patient.
 - Place ID sticker directly on infant and on inside band of diaper. If time permits, 2 RN's should verify patient ID before placing sticker on infant.
 - If infant not being transported in bed, tape bedside cards to chart
 - Prepare hard chart and bedside chart to go with patient. A frequent vital flow sheet to record vitals during transport will be included in bedside evacuation bag.
 - Gather patient meds and put in baggie with patient label.
 - Retrieve bedside evacuation bag and double check supplies are all present.
- **VENTILATION**
 - Vented and C-PAP patients are hand ventilated with self inflating bag (kept at all bedsides). If portable O₂ tanks available, may use flow inflating bag.
 - Nasal cannula patients will be hooked up to portable O₂ (if available)

- **FLUID MANAGEMENT**

- Make sure IV pumps are working on battery power, if not obtain new pump. (Ideally, all pumps will leave with a fully charged battery).
- Single channel will run for 11 hours on battery if running at 2 ml/hour.
- Triple channel will run for 4 hours on battery if running at 2 ml/hour.
- Smith's Medical™ syringe pumps will run 2 hours on battery
- Any non-essential IV fluids may be disconnected. If conditions do not permit transporting IV pumps, essential fluids may be drawn up in a large syringe to be hand pushed during transport.
- CNG feeds can be maintained by intermittent slow push.

- **SUCTION**

- Any chest tubes should be placed to water seal or connected to a Pneumostat™ chest drain valve.
- Gastric decompression can be maintained by aspiration with a syringe

- **THERMOREGULATION**

- Cover infant with hat and blankets. For infants requiring additional thermoregulation, chemical warming mattresses are located in the evacuation bags in each pod. NOTE: mattress should be covered with blanket prior to placing infant on it. If warming mattress is not available, heel warmers are in bedside evacuation bags and can be placed under infant and covered with blanket prior to placing baby on top. NeoWrap's™ are also available to wrap infants in from the neck down.

- **VITAL SIGNS**

- Use Massimo™ Pulse Oximeter for transport. If not enough are available, prioritize by patient acuity.
- Vital signs should be recorded every ½ hour (via auscultation, palpation or Massimo™).

PCA/PCT

- Retrieve Pod Evacuation bag and distribute supplies as needed.
- Assist RN as necessary.

SECRETARY

- Stay at desk as long as possible to facilitate communication.
- Print or write out current census (should be done every shift and kept current).
- Collect a facesheet and sticker from every patient and fill out emergency evacuation log.

RESIDENT

- Gather patient worksheets.
- Assist Neonatologist as necessary.

RESPIRATORY

- Organize and obtain O₂ tanks
- Assist Staff RN in preparing to move patient

All personnel are to remain in the designated evacuation location until permission is granted to return to the unit.

ONGOING RESPONSIBILITIES

- All staff who work in the NICU are responsible for annual review of protocol.
- Responsibility for ongoing maintenance of emergency equipment:
 - Respiratory dept. will check oxygen tanks in storage.
 - PCT will check Pod evacuation bags every 6 months (week of time change) and make sure Massimo's™ are plugged in daily.
 - Staff RN will check bedside evacuation bags every month (1st of month).

STAFF EDUCATION

- Pocket cards/ID card
- Marathon Days
- Mock disaster drills

REFERENCES

- Franck, L., Epstein, B., & Adams, S. (1993). "Disaster preparedness for the ICN: Evolution and testing of one unit's plan". Pediatric Nursing, 19 (2), 122-127.
- Kennedy, J. (1983). "Evacuation of a neonatal unit". Canadian Nurses Association, 79(5), 26-29.
- Mulligan, K.S. & Webb, L.Z. (1988). "Developing an evacuation procedure for a nursery complex". 6(6), 47-52.
- Prade, K. (1998). "Development of an NICU-Specific disaster and evacuation plan - One hospital's experience". Neonatal Network, 17(4), 65-69.
- Verklan, M.T., Kelley, K., Cater, L. & Brumley, K. (2002). "The day the rain came down". AJN, 102(3), 24AA-254JJ.

Protocol obtained from Advocate Christ Medical Center/Hope Children's Hospital, Oak Lawn, IL with their written permission to incorporate this protocol into the NICU Evacuation Guidelines. September 30, 2008

ANNEX D:
NICU DISASTER EQUIPMENT/SUPPLY LIST
ADVOCATE CHRIST MEDICAL CENTER, OAK LAWN, IL
NOVEMBER 2008

BEDSIDE EVACUATION BAG

HAT
TAPE
BULB SYRINGE
RUBBERBANDS X 5
SUTURE REMOVAL KIT (expires)
HEEL WARMER X 5
PINK SQUIRTS X 1 – 4 PACK (expires)
BLUE SQUIRTS X 1 – 4 PACK (expires)
BIOCLUSIVE™ X 2 (expires)
TEGADERM™ X 2 (expires)
5 ML ORAL SYRINGES X 5
5 ml SALINE FLUSHES X 3 (expires)
3 ML SYRINGE X 5
5 ML SYRINGE X 5
10 ML SYRINGE X 5
30 ML SYRINGE
60 ML SYRINGE
TWIN PACK X 5
NG TUBE 5 FR
NG TUBE 8 FR
SURGILUBE™ (expires)
BAGGIE WITH 5 PAIR SIZE MEDIUM GLOVES
CHLORAPREP™ X 10 (expires)
IV BOARD 1 LG/1 SMALL
T-PIECE X 2
ANGIOCATH X 5
IV TUBING X 2
MICROCLAVE™ X 2
WET WIPE
ALCOHOL PAD X 20
FREQUENT VITAL SIGN SHEET
FLASHLIGHT
BATTERIES
DIAPER CUDDLEBUN™ X 2
DIAPER PREEMIE X 2
PEN

PROTOCOL COPY
WRITTEN REMINDER TO IDENTIFY THE
PATIENT
SURGICAL MARKING PEN
HAND GEL
NEOWRAP™

POD/ROOM EVACUATION BAG

(LOCATED IN EACH POD BY THE FRONT DOOR
WITH EMERGENCY VESTS)

WARMING MATTRESS
PNEUMOSTAT CHEST DRAIN™ X 2 (expires)
DELEE™ SUCTION X 2
EXTRA HATS X 3
FLASHLIGHT
PEN
PROTOCOL COPY
SURGICAL MARKING PEN
HAND GEL
NEOWRAP™

Equipment list obtained from Advocate Christ Medical Center/Hope Children's Hospital, Oak Lawn, IL with their written permission to incorporate this document into the NICU Evacuation Guidelines. November 14, 2008

ANNEX E: EMERGENCY PREPAREDNESS BOX RUSH UNIVERSITY MEDICAL CENTER, CHICAGO, IL NOVEMBER 2008

Emergency Preparedness Box Special Care Nursery

	Date:	Date:	Date:
Item	Quantity	Quantity	Quantity
1 Self-Inflating Bag			
1 Flashlight			
2 Batteries	Exp date Exp date	Exp date Exp date	Exp date Exp date
1 Surgical Marking Pen			
1 Pen			
1 Note Pad			
1 Pair of Scissors			
1 Tape-1in			
1 Bag			
Lock #			
Signature			

Instructions for Use:

The NICU evacuation box is intended for the immediate needs of the infant. The box is easily stackable in a cabinet. In the event of an evacuation, the boxes are distributed to every bedside. The contents include a surgical marking pen for identification. A self inflating resuscitation bag with neonate and infant masks, adhesive tape, and scissors are included for airway securing and ventilation. The box also contains a flashlight and batteries, notepad and pen, and a plastic bag for items such as medications, chart, feeding, etc.



Equipment list and photo obtained from Rush University Medical Center, Chicago, IL with their written permission to incorporate this material into the NICU Evacuation Guidelines. November 18, 2008

ANNEX F:

HICS 260 - PATIENT EVACUATION TRACKING FORM

WWW.EMSA.CA.GOV/HICS/



HICS 260 – PATIENT EVACUATION TRACKING FORM			
1. DATE		2. UNIT	
3. PATIENT NAME	4. AGE	5. MR #	
6. DIAGNOSIS (-ES)		7. ADMITTING PHYSICIAN	
8. FAMILY NOTIFIED			
<input type="checkbox"/> YES <input type="checkbox"/> NO CONTACT INFORMATION:			
9. ACCOMPANYING EQUIPMENT (CHECK THOSE THAT APPLY)			
<input type="checkbox"/> Hospital Bed	<input type="checkbox"/> IV Pumps	<input type="checkbox"/> Isolette/Warmer	<input type="checkbox"/> Foley Catheter
<input type="checkbox"/> Gurney	<input type="checkbox"/> Oxygen	<input type="checkbox"/> Traction	<input type="checkbox"/> Halo-Device
<input type="checkbox"/> Wheel Chair	<input type="checkbox"/> Ventilator	<input type="checkbox"/> Monitor	<input type="checkbox"/> Cranial Bolt/Screw
<input type="checkbox"/> Ambulatory	<input type="checkbox"/> Chest Tube(s)	<input type="checkbox"/> A-Line/Swan	<input type="checkbox"/> IO Device
<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Other
ISOLATION <input type="checkbox"/> YES <input type="checkbox"/> NO		TYPE	
REASON			
10. DEPARTING LOCATION		11. ARRIVING LOCATION	
ROOM#	TIME	ROOM #	TIME
ID Band Confirmed <input type="checkbox"/> YES <input type="checkbox"/> NO	By:	ID Band Confirmed <input type="checkbox"/> YES <input type="checkbox"/> NO	By:
Medical Record Sent <input type="checkbox"/> YES <input type="checkbox"/> NO		Medical Record Sent <input type="checkbox"/> YES <input type="checkbox"/> NO	
Addressograph Sent <input type="checkbox"/> YES <input type="checkbox"/> NO		Addressograph <input type="checkbox"/> YES <input type="checkbox"/> NO	
Belongings <input type="checkbox"/> with Patient <input type="checkbox"/> Left in Room <input type="checkbox"/> None		Belongings Received <input type="checkbox"/> YES <input type="checkbox"/> NO	
Valuables <input type="checkbox"/> with Patient <input type="checkbox"/> Left in Safe <input type="checkbox"/> None		Valuables <input type="checkbox"/> YES <input type="checkbox"/> NO	
Medications <input type="checkbox"/> with Patient <input type="checkbox"/> Left on Unit <input type="checkbox"/> to Pharmacy		Medications Received <input type="checkbox"/> YES <input type="checkbox"/> NO	
PEDS/INFANTS			
Bag/Mask with Tubing Sent <input type="checkbox"/> YES <input type="checkbox"/> NO		Bag/Mask with Tubing Received <input type="checkbox"/> YES <input type="checkbox"/> NO	
Bulb Syringe Sent <input type="checkbox"/> YES <input type="checkbox"/> NO		Bulb Syringe Received <input type="checkbox"/> YES <input type="checkbox"/> NO	
12. TRANSFERRING TO ANOTHER FACILITY			
TIME TO STAGING AREA		TIME DEPARTING TO RECEIVING FACILITY	
DESTINATION			
TRANSPORTATION <input type="checkbox"/> Ambulance Unit <input type="checkbox"/> Helicopter <input type="checkbox"/> Other:			
ID BAND CONFIRMED <input type="checkbox"/> YES <input type="checkbox"/> NO BY: (please print)			
DEPARTURE TIME			
13. FACILITY NAME			

PURPOSE: Document details and account for patients transferred to another facility. **ORIGINATION:** Medical Care Branch Director
ORIGINAL TO: Patient **COPIES TO:** Patient Tracking Manager and Departing Location

HICS 260

ANNEX G:

HICS 213 – INCIDENT MESSAGE FORM

WWW.EMSA.CA.GOV/HICS/



HICS 213 – INCIDENT MESSAGE FORM			
1. FROM (Sender):		2. TO (Receiver):	
3. DATE RECEIVED	4. TIME RECEIVED	5. RECEIVED VIA	6. REPLY REQUESTED:
		<input type="checkbox"/> Phone <input type="checkbox"/> Radio	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> Other	If Yes, REPLY TO (if different from Sender):

7. PRIORITY	<input type="checkbox"/> Urgent - High <input type="checkbox"/> Non Urgent – Medium <input type="checkbox"/> Informational - Low
-------------	---

8. MESSAGE (KEEP ALL MESSAGES / REQUESTS BRIEF, TO THE POINT, AND VERY SPECIFIC):

9. ACTION TAKEN (if any):

Received by:	Time Received:	Forward to:
Comments:		

Received by:	Time Received:	Forward to:
Comments:		

10. FACILITY NAME

Purpose: Provide standardized method for recording messages received by phone or radio **Origination:** All Positions
Original to receiver. **Copies to:** Documentation Unit Leader and Message Taker

HICS 213

ANNEX H:

SAMPLE NICU EVACUATION CALL TREE {INSERT HOSPITAL NAME OR LOGO}

DEPARTMENT CALL TREE

NICU Management Staff

NAME	TITLE	CONTACT NUMBERS	CONTACT STATUS		ARRIVAL STATUS	HAS FAMILY PLAN YES/NO	NEEDS FAMILY CARE		INCIDENT ASSIGNMENT
			Received message	Left message			Y/N	How many	
		H: C: W:							
		H: C: W:							
		H: C: W:							

Department staff residing within 30 MINUTES of hospital

NAME	TITLE	CONTACT NUMBERS	CONTACT STATUS		ARRIVAL STATUS	HAS FAMILY PLAN YES/NO	NEEDS FAMILY CARE		INCIDENT ASSIGNMENT
			Received message	Left message			Y/N	How many	
		H: C: W:							
		H: C: W:							

SAMPLE NICU EVACUATION CALL TREE (CONT'D)

{INSERT HOSPITAL NAME OR LOGO}

Department staff residing within 60 MINUTES of hospital

NAME	TITLE	CONTACT NUMBERS	CONTACT STATUS		ARRIVAL STATUS	HAS FAMILY PLAN YES/NO	NEEDS FAMILY CARE		INCIDENT ASSIGNMENT
			Received message	Left message			Y/N	How many	
		H: C: W:							
		H: C: W:							

Department staff residing more than 60 MINUTES from hospital

NAME	TITLE	CONTACT NUMBERS	CONTACT STATUS		ARRIVAL STATUS	HAS HOME FAMILY PLAN YES/NO	NEEDS FAMILY CARE		INCIDENT ASSIGNMENT
			Received message	Left message			Y/N	How many	
		H: C: W:							
		H: C: W:							

ANNEX I:

SAMPLE HICS ORGANIZATIONAL CHART FOR NICU EVACUATION

The Hospital Incident Command System (HICS) was created to assist hospitals/healthcare agencies improve their emergency management planning, response and recovery capabilities during unplanned and planned events. In 2006, HICS replaced the Hospital Emergency Incident Command System (HEICS). Key revisions include: principles created to assist hospitals prepare and respond to various types of emergency and non-emergency situations; an Incident Management Team Chart with updated and expanded Job Action Sheets; NIMS compliant forms; and hazard specific planning and operational guidance. The purpose of a structured command system is to assist hospitals of all sizes advance their emergency preparedness levels and respond to incidents and events as individual entities and as part of their communities.

The core principles of an Incident Command System are as follows:

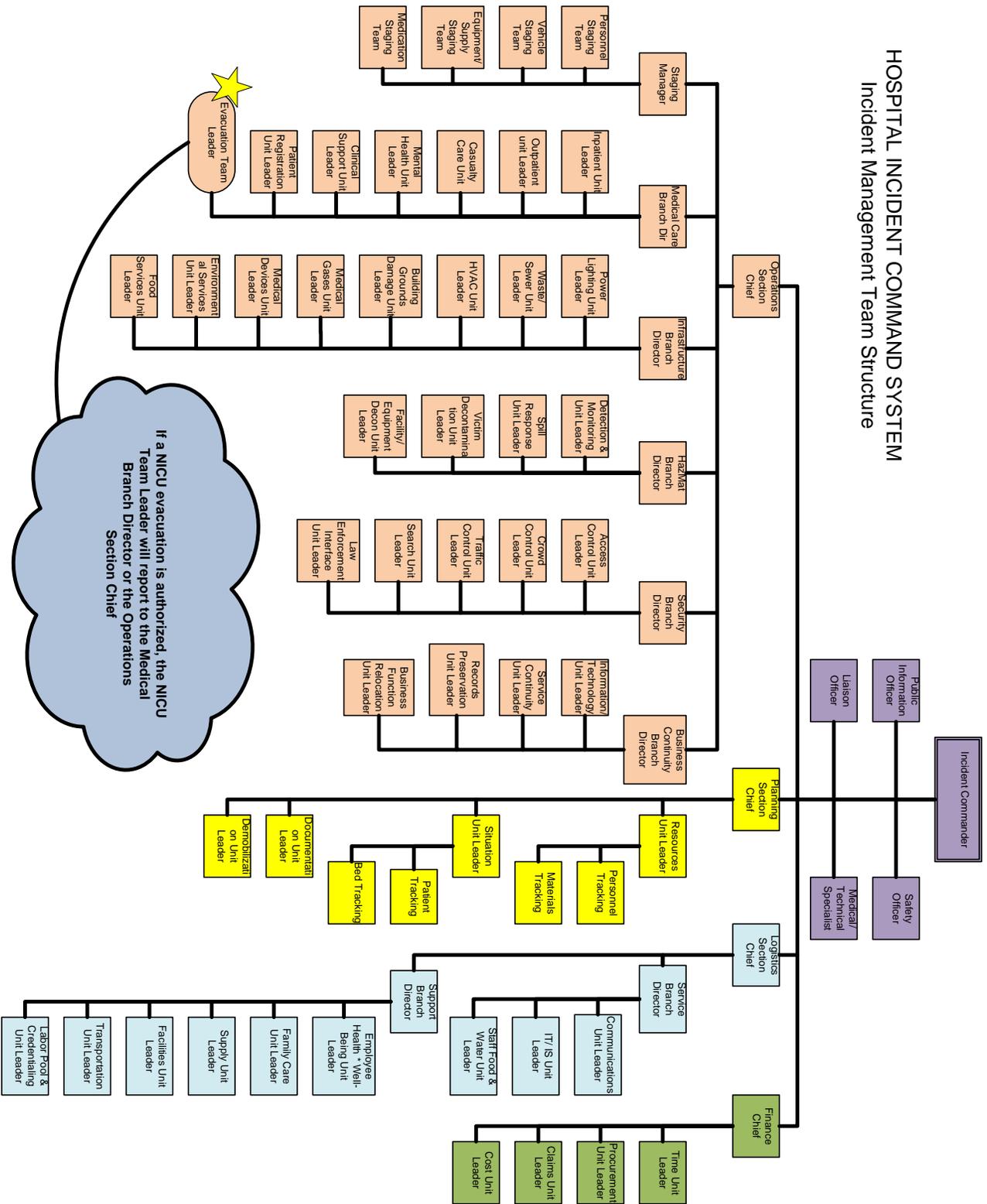
- ❖ Establishing a clear chain of command to manage all routine and planned events of any size or type
- ❖ Allowing personnel from different agencies or departments to integrate into a common command structure that effectively addresses issues and delegates responsibilities
- ❖ Providing needed logistical and administrative support to operational personnel
- ❖ Eliminating duplication of efforts
- ❖ Using clear language – eliminating industry codes/terms while managing an emergency situation

The organizational chart attached addresses all positions under a fully operational incident command structure. This chart depicts the positions/functions needed for communication and coordination between operating groups during a situation or event that disrupts normal operating procedures.

Please note that while an Evacuation Team Leader/“Team Leader/Neonatal Intensive Care” position/function is not represented in the standard HICS organizational structure, it has been placed under the Medical Care Branch Director pursuant to the instructions outlined in the Job Action Sheet for this specific position/function. For the purposes of clarity in this document, a yellow star has been placed next to this position/function.

The purpose of the illustration is to visualize the chain of command structure should a NICU evacuation be authorized. NICU personnel should be familiar with this organizational structure **prior** to the response phase of an evacuation and follow the hospital’s evacuation plan and chain of command structure in order to have an effective and coordinated process.

HOSPITAL INCIDENT COMMAND SYSTEM Incident Management Team Structure



If a NICU evacuation is authorized, the NICU Team Leader will report to the Medical Branch Director or the Operations Section Chief

ANNEX J: JOB ACTION SHEET TEAM LEADER – NEONATAL INTENSIVE CARE

Mission: Advise the Incident Commander or Operations Section Chief/Medical Care Branch Director, as assigned, on issues related to neonatal emergency response.

Date: _____	Start: _____	End: _____	Position Assigned to: _____	Initial: _____
Position Reports to: _____		Signature: _____		
Hospital Command Center (HCC) Location: _____			Telephone: _____	
Fax: _____		Other Contact Info: _____		Radio Title: _____

Immediate (Operational Period 0-2 Hours)	Time	Initial
Receive appointment and briefing from the Medical Branch Director or Operations Section Chief, as assigned.		
Read this entire Job Action Sheet and review incident management team chart.		
Notify your usual supervisor of your HICS assignment.		
Meet with the Medical Branch Director or Operations Chief to discuss neonatal care needs.		
Communicate with the Medical Branch Director or Operations Section Chief to obtain/communicate: <ul style="list-style-type: none"> • Type and location of incident • Number and condition of expected patients and/or expected patients for evacuation • Estimated arrival time or departure time from facility • Unusual or hazardous environmental exposure 		
Request staffing assistance from the Labor Pool and Credentialing Unit Leader, as needed, to assist with rapid research as needed to determine hazard and safety information critical to treatment, evacuation and for the neonates.		
Ensure neonatal patient identification and tracking practices are being followed.		
Communicate and coordinate with Logistics Section Chief to determine: <ul style="list-style-type: none"> • Medical care equipment and supply needs • Medications with pediatric dosing • Transportation availability and needs (carts, cribs, wheel chairs, etc.) 		

Immediate (Operational Period 0-2 Hours)	Time	Initial
Communicate with Planning Section Chief to determine: <ul style="list-style-type: none"> • Bed availability • Ventilators • Trained medical staff (MD, RN, PA, NP, etc.) • Additional short and long range neonatal response needs 		
Ensure that appropriate standards of care are being followed in the clinical areas as appropriate for the emergency.		
Ensure that all attempts have been taken to reach patient family members if not onsite to notify them of the evacuation.		
Collaborate with the PIO to develop media and public information messages specific to neonatal care recommendations and treatment.		
Participate in briefings and meetings and contribute to the Incident Action Plan, as requested.		
Document all communications (internal and external) on an Incident Message Form (HICS Form 213). Provide a copy of the Incident Message Form to the Documentation Unit.		

Intermediate (Operational Period 2-12 Hours)	Time	Initial
Continue to communicate and coordinate with Logistics Section Chief the availability of neonatal equipment and supplies.		
Coordinate with Logistics and Planning Section Chiefs to expand/create a neonatal Patient Care area, if needed.		
Continue to monitor neonatal care activities to ensure needs are being met.		
Meet regularly with the Operations Section Chief and Medical Care Branch Director for updates on the situation regarding hospital operations and pediatric needs.		

Extended (Operational Period Beyond 12 Hours)	Time	Initial
Assess for inappropriate responses or behaviors in patient families and/or staff during the emergency event.		
Ensure the provision of resources for mental health and appropriate event education for patient families and staff.		
Continue to ensure neonatal related response issues are identified and effectively managed.		
Continue to meet regularly with the Operations Section Chief or Incident Commander, as appropriate, for situation status updates and to communicate critical neonatal care issues.		
Ensure your physical readiness through proper nutrition, water intake, rest, and stress management techniques.		

Extended (Operational Period Beyond 12 Hours)	Time	Initial
Observe all staff and volunteers for signs of stress and inappropriate behavior. Report concerns to the Mental Health Unit Leader. Provide for staff rest periods and relief.		
Upon shift change, brief your replacement on the status of all ongoing operations, issues and other relevant incident information.		

Demobilization/System Recovery	Time	Initial
Ensure return/retrieval of equipment and supplies and return all assigned incident command equipment.		
Upon deactivation of your position, ensure all documentation is submitted to the Operations Section Chief or Incident Commander, as appropriate.		
Upon deactivation of your position, brief the Operations Section Chief or Incident Commander, as appropriate, on current problems, outstanding issues, and follow-up requirements.		
Submit comments to the Operations Section Chief or Incident Commander, as appropriate, for discussion and possible inclusion in the after-action report; topics include: <ul style="list-style-type: none"> • Review of pertinent position descriptions and operational checklists • Recommendations for procedure changes • Section accomplishments and issues 		
Participate in stress management and after-action debriefings. Participate in other briefings and meetings as required.		

Documents/Tools
<ul style="list-style-type: none"> • HICS Form 213 – Incident Message Form • HICS Form 260 - Patient Evacuation Tracking Form • Hospital emergency operations plan • Hospital organization chart • Hospital telephone directory • Radio/satellite phone • Local public health reporting forms

ANNEX K: NICU EVACUATION JOB ACTION SHEET ANCILLARY STAFF ROLES AND RESPONSIBILITIES

Mission: Assist in evacuation process of the Neonatal Intensive Care Unit (NICU)

Ancillary Staff: Bio-med engineering, Physical Therapists, Housekeeping, Facilities, Security, Pharmacists, Respiratory Therapists, laboratory technicians, other non-clinical departments.

Date: _____ Start: _____ End: _____ Position Assigned to: _____ Initial: _____

Position Reports to: NICU Team Leader Signature: _____

Hospital Command Center location: _____ Telephone: _____

Fax: _____ Other contact info.: _____ Radio Title: _____

Immediate (Operational Period 0-2 hours)	Time	Initial
Receive appointment, briefing and any appropriate materials/tools from the NICU Team Leader.		
Wear picture identification and, if applicable, a position vest.		
Read this entire job action sheet.		
Obtain situation briefing from NICU evacuation staff.		
Notify your usual supervisor of your HICS assignment.		
Coordinate with NICU staff response needs for evacuation.		
Coordinate with NICU Team Leader to request resource assistance.		
Become familiar with all NICU evacuation routes.		

Intermediate (Operational Period 2-12 hours)	Time	Initial
Meet regularly with NICU Team Leader to receive ad hoc assignments.		
Continue to closely work with NICU evacuation staff to minimize gaps in operations.		
Obtain direction from NICU evacuation staff and proceed accordingly.		
Upon direction from NICU evacuation staff, assist in relieving stressed and fatigued staff.		
Assist team in runner capacity.		

Respond to all situational changes during evacuation process.		
Advise NICU evacuation staff or NICU Team Leader immediately of any operational issue you are not able to correct, resolve or carry out.		

Extended (Operational Period beyond 12 hours)	Time	Initial
Continue to receive ad hoc assignments from NICU evacuation staff.		
Continue to maintain operational status per NICU evacuation staff directions.		
Ensure your physical readiness through proper nutrition, water intake, rest and stress management techniques.		
Observe NICU evacuation staff and NICU patients for signs of stress and inappropriate behaviors. Notify NICU Team Leader of any concerns observed.		
Upon shift change, brief your replacement on the status of all ongoing operations.		

Demobilization/System Recovery	Time	Initial
If applicable, notify NICU Team Leader when you have completed your assignment.		
Notify your immediate supervisor of your incident assignment completion.		
If possible, submit your incident comments to the NICU Team Leader (i.e., challenges encountered, areas of opportunity, equipment failure, additional training recommended).		
Participate in stress management and after action briefings. Participate in other briefings and meetings as required or highly recommended.		

Documents/Tools
<ul style="list-style-type: none"> • HICS 213 Incident Message Form • Identification Vests (if applicable) • Radio/Communication device • Incident Management Telephone Directory • Flashlight • Paper • Pens/pencils • Evacuation equipment as needed

ANNEX L:

NEONATAL INTENSIVE CARE UNIT EVACUATION ISSUES

“LESSONS LEARNED”

SEPTEMBER 2008

Baldwin, Steve, Andria Robinson, Pam Barlow, and Crayton A. Fargason. "Moving Hospitalized Children All Over the Southeast: Interstate Transfer of Pediatric Patients During Hurricane Katrina." Pediatrics 117 (2006): s416-420.

- Those setting up transport for children bypass adult-oriented facilities in favor of specialized children's hospitals
- Current disaster plans are not designed to accommodate such patient movement
- Without reliable communication, chaos is predictable
- The need for regional jurisdiction was identified but coordinated by private ad-hoc response networks

Bernard, M & Matthews, P "Evacuation of a maternal-newborn area during Hurricane Katrina, MCN, (2008): 33(4), 213-223

- All hospitals and nursing homes have 800 MHz satellite radios
- New Orleans is a P25 compliant (ensuring interagency interoperability) city with monthly local, state and regional level testing
- Each hospital is advised to have a Public Information Officer (PIO)
- Designated staff in each hospital are required to be trained on critical incident stress debriefing
- Many hospitals have wells to ensure an adequate water supply
- Patient evacuation plans have been devised that include prearrangements with specific facilities for specific patient groups
- Disaster drills that emphasize evacuation have taken place on city and state wide levels

Bowers, Paula J., Margaret L. Maguire, Patricia A. Silva, and Rhonda Kitchen. "Everybody Out!" Nursing Management April 2004: 50-54.

- Improvisation during the disaster following the loss of electrical power included patient ventilation using intermittent positive-pressure breathing machines, monitoring electrocardiograms of unstable patients using defibrillators, titrating IV rates using IV flow-rate devices, using PDA's and cell phones as light sources, using piston syringes for suctioning

Cocanour, Christine S., Steven J. Allen, Janine Mazabob, John W. Sparks, Craig P. Fischer, Juanita Romans, and Kevin P. Lally. "Lessons Learned From the Evacuation of an Urban Teaching Hospital." Arch Surg 137 (2002): 1141-1145.

- Electrical power outages are not necessarily temporary—begin evacuation if the cause of the electrical disruption cannot be quickly repaired
- Have a reliable in-house communication system not dependent on telephone lines or electricity
- A central command system is essential
- Have flashlights available on all units with batteries (one of every patient or patient room)
- Have back up batteries for ventilators

- Have keys to Pyxis/medication storage machines
- Institute an equipment tracking system
- Maintain a paper record of all patients
- It would be prudent to bring patients from upper floors when more help was fresh and available rather than keeping patients on the upper floors until ready to evacuate
- Maximize volunteers when they are available and fresh
- Coordinate loading of ambulance and helicopters for patient transfer (no more than one critical patient to an accepting hospital at one time)
- Reassign staff as necessary to care for transferred patients (via staffing hotline)

Ginsberg, Harley G. "Sweating it out in a Level III Regional NICU: Disaster Preparation and Lessons Learned at the Ochsner Foundation Hospital." Pediatrics 117 (2006): s375-380.

- Long distance calls had a higher likelihood of success than calls to same area code
- Internet functioned
- Text messaging was more reliable than a telephone call
- Limited to bedside point-of-care testing only
- Based on face sheet demographics on chart, determination made to send to closest appropriate NICU
- Heat and humidity kept monitors from functioning properly
- Once most patients evacuated, staff can depart in caravans for safety
- Decision to back transfer patients needs to be made at end of disaster
- Power feeder lines need to be relocated; consider additional portable generators
- Evaluate use of satellite phones

Hogan, Catherine. "Responding to a Fire at a Pediatric Hospital." AORN Journal April 2002.

- Emergency communication during the disaster was hampered by the use of portable radios because not all staff members were familiar with their use
- Emergency services transportation buses were not appropriate for incubator support, so alternate resources need to be located for neonates
- Patient care stock is rapidly depleted, so when patients are transferred to an alternate site, supplies also need to be moved

Hoyt, K S., and Ann E. Gerhart. "The San Diego County Wildfires: Perspectives of Healthcare Providers." Disaster Management & Response 2 (2004): 46-52.

- Pre-identify optimal receiving facilities
- Identify professional challenges, such as when healthcare providers were called to be emergency responders at the same time they were real or threatened wildfire victims
- It is important to look for professional help outside of the immediate disaster area along with tapping the community for non-professional help

Minnick, Jody. "Small and Smaller." Air Medical Journal 25 (2006): 122-123.

- Consider Call Centers for coordination of transports
- Prepare a statewide plan for future mass evacuations
- List resources for fixed-wing and helicopter programs that are capable of transporting pediatric and neonatal teams and patients, and a database with information on programs and their capabilities for hospitals to use when faced with the prospect of mass evacuations

Orlando, Susan, Marirose L. Bernard, and Pamela Mathews. "Neonatal Nursing Care Issues Following a Natural Disaster." Journal of Perinatal & Neonatal Nursing 22 (2008): 147-153.

- Observation has always been the most powerful tool for a neonatal nurse
- Hyperthermia posed a great risk in Katrina, so neonates required more frequent monitoring of body temperature
- If neonates were hypothermic, infants were placed tighter in one incubator to avoid overburdening auxiliary power or wrapped in blankets layered with plastic wrap
- Unanticipated delays en route to receiving hospitals highlighted the need to have a sufficient oxygen supply for infants who required ventilation during transportation
- Need an ample supply of self-inflating anesthesia bags
- Each battery-operated device should have a charging cable and remain plugged in and charged while the power source is available
- Actions to preserve battery life on infusion pumps may include a plan to change continuous feedings to bolus feedings for some infants
- Consider weaning infants off of intravenous fluids on an accelerated schedule as tolerated
- All equipment in use during an evacuation to another facility should be clearly labeled with owner identification (Inventory)
- To enhance evacuations, key institutions need to be identified before a disaster to handle communication and organization of transport
- Transport incubators were reserved for the most critically ill infants
- Non-traditional transport equipment included bassinets, infant car seats, and the arms of doctors and nurses
- In addition to the standard identification bracelet, the infant's name was written on a length of tape and secured to the blanket wrapped around the infant
- Disaster plans should address how medical information can be transmitted to the receiving units
- If a potential weather threat exists, then a weekly summary of an infant's hospital course should be considered
- Shorter than 12 hour shifts should be considered during a disaster to maintain stamina
- Plans should be developed and reviewed as new knowledge is gained from experience
- All nurses should know the essential elements of their hospital disaster plan

Perrin, Keith. "Closing and Reopening of a Children's Hospital during a Disaster." Pediatrics 117 (2006): s381-385.

- Disaster plans need to be practiced and updated regularly and need to provide for a complete evacuation of the facility
- There was no uniform method for evacuating patients, particularly the critically ill ones so hospitals used contacts in other states or parent organizations or associations to help in the emergency
- Management of patient's family members, children of staff, and pets became problems
- Communication is crucial and the Internet functioned better than telephone systems
- Access to medical records that were destroyed was provided through a state immunization registry which highlights the value of such registries (it is recommended to include children with special healthcare needs on a retrievable database system)

Rice, Karen L., Lisa S. Colletti, Sylvia Hartmann, Rose Schaubhut, and Nancy L. Davis. "Learning From Katrina." Nursing 2006 36 (2006): 44-47.

- Plan for self-sufficiency but make sure the facility's plans mesh with local, state and federal planning as much as possible
- Linens became stretchers to take patients to the critical care unit. Since carrying someone up and down stairs is exhausting, a relay system was developed

- Functioning generators are key to adequate back-up power, especially for life-support systems and lighting, but don't count on them to solve all problems. Determine how to move patients without elevators, where to get clean water, and how to dispose of sewage and hazardous waste
- Expect the usual communications methods to fail—consider an internal wireless system, radio and satellite communications devices that are compatible with governmental devices
- Secure the premises early and effectively; set up a centralized process to register and track all employees, visitors and family members
- The transportation plan must be adaptable to various situations
- Where will staff, families and patients stay during an extensive disaster?
- Have pastoral care and social work staff available to support patients, caregivers, employees and families
- Establish a centralized process to register and deploy volunteers

Sexton, Karen H., Lynn M. Alperin, and John D. Stobo. "Lessons from Hurricane Rita: the University of Texas Medical Branch Hospital's Evacuation." *Academic Medicine* 82 (2007): 792-796.

- Three staging areas developed to facilitate the evacuation to ensure patient safety: first was at the bedside, the second at the hospital exit, and the third when the patient was loaded onto group or air transportation
- Develop and communicate a set of guiding principles to frame every decision, with patient safety paramount
- Every patient was transported with the appropriate mode, with proper identification, and pertinent medical information, to ensure that no one would be lost
- Avoid delay in deciding to evacuate; base the decision on patient and employee safety and not on financial considerations
- Identify strategic partners in advance because successful evacuation of critical and acute care patients can be accomplished only if another facility will accept them.
- A well-designed evacuation plan should factor in the safe transport of 'excess' personnel in the event you have more faculty and staff on hand than you need to maintain core functions once the patients have been evacuated
- Conduct trial runs of the emergency preparedness plans
- Use a single format to capture data regarding patient transport, on-site personnel and other critical information

Spedale, Steven B. "Caring for Displaced Neonates: Intrastate." *Pediatrics* 117 (2006): s389-395.

- Key to successful evacuations and provision of care for neonates from New Orleans was the administration's preparation for such a disaster, including a chain of command and responsibilities
- A list of pediatric facilities, providers and modes of transport as well as evacuation routes must be included in any disaster/evacuation plan
- The relocation of major services, such as CV Surgery, ECMO, critical care units and teaching programs should be included in any disaster plan
- Shelters for children and families should be part of the plan, especially since shelters do not usually accept pregnant women after 34 weeks gestation
- There should be several people in each state capable of serving as the overall coordinator in a crisis
- The biggest obstacle in many cases was communication
- Alternative communications such as satellite phones and radio systems should be in place
- Allocate time for staff, including physicians, to rest and recuperate
- Accurate information is paramount to dispelling rumors during a crisis

Verklan, Terese M., Katherine Kelley, Loye Carter, and Karen Brumley. "The Day the Rain Came Down: Stranded in the NICU by Tropical Storm Allison." American Journal of Nursing 102 (2002): 24AA-24II.

- Don't take the elevator if a risk of losing power
- Once decision made to begin evacuation, need to update medical records for transport
- Perineum packs used for warmth
- A decentralized command post was set up in the NICU area to determine who was going to which hospital and in which order of priority
- A neonatologist stayed in the ambulance bay and directed traffic of ambulances and helicopters
- Babies were secured on backboard with tape, identification stickers covering them; blankets, equipment and oxygen tanks were strapped to the board and carried down the steps
- Patient monitoring was done with only assessment skills and a stethoscope
- Do you have the following equipment? Battery operated monitoring equipment, battery operated suction machines, buretrols and 'dial-a-flow' intravenous systems, portable, manual blood pressure cuffs and sphygmomanometers, flashlights, back up batteries for all equipment, tape for timing of IV bags, portable water canisters, moistened towelettes, up-to-date- names and phone numbers on disaster calling tree, cell phones, portable battery operated lights, system for taking battery operated equipment to be recharged at a place that has electricity, extra cleaning solution to be used on equipment shared among patients, plan to transport staff and equipment as needed and pick up supplies from outside the hospital

ANNEX M:

NEONATAL INTENSIVE CARE UNIT EVACUATION

BIBLIOGRAPHY

HIGHLIGHTED FINDINGS

Allen, Gwenn M., Steven J. Parrillo, Jean Will, and Johnathon A. Mohr. "Principles of Disaster Planning for the Pediatric Population." Prehospital and Disaster Medicine 22 (2007): 537-540.

- Disaster planners have failed to meet needs of the pediatric population
- Gaining EMSC Pediatric Facility Recognition is an important first step toward preparedness
- Conducting pediatric intensive care drills, improving pediatric surge capacity, and ensuring that the needs of children are incorporated into all levels of disaster plans can augment efforts even further
- EMSC Performance Measure 66 mandates that by 2011, states must implement a standardized system for identification of hospitals capable of providing or managing pediatric emergency care [achieved in Illinois]
- Hospitals can improve their pediatric response vastly by including a pediatric mass-casualty incident in their drills at least once every two years
- Planners should not assume that children will be in the custody of their parents when a disaster occurs

Baldwin, Steve, Andria Robinson, Pam Barlow, and Crayton A. Fargason. "Moving Hospitalized Children All Over the Southeast: Interstate Transfer of Pediatric Patients During Hurricane Katrina." Pediatrics 117 (2006): s416-420.

- "Can hospitalized children, in a geographic area, have their continuing medical needs met when capacity in that geographic area is exceeded?"
- A chronological timeline of pediatric activities related to the care of patients in Tulane University Hospital, Children's Hospital of New Orleans and Alton Ochsner Foundation Hospital at the time of Katrina's landfall
- Pre-Katrina: Southeastern Regional Pediatric Disaster Response Network—concern that state and federal planning for pediatrics did not seem to be a priority
- Pediatric patient evacuation was not centrally coordinated at the governmental level but was at a corporate level
- It was noted that response from Children's hospitals with supplies (diapers, infant formula, toothbrushes, antiseptic, scrubs, fresh fruit, juices, medical supplies, personal items and water) was more heavily provided by institutions with significant pediatric experience
- Before Katrina the cost of transporting neonates and children out of disaster-impacted areas was viewed by many as not financially or operationally viable, but a significant portion of pediatric inpatients were transported outside New Orleans to specialized pediatric facilities both within and outside the state.
- If pediatric inpatient capacity is more limited relative to the baseline population of children (less than 5% of the total pediatric population uses inpatient care), then to increase pediatric capacity during a disaster, a more regionalized approach must be considered for children.
- Shortages of care resources as well as a waste of resource capacity was evident
- Inter-state collaboration of public did not filter down to pediatric providers in an organized manner; a more informal, distributed network facilitated care
- Personal contact facilitated evacuation efforts
- Activation of the National Disaster Medical System (NDMS) did not significantly impact immediate pediatric care

Barkemeyer, Brian M. "The University Hospital NICU in the Midst of Hurricane Katrina: Caring for Children without Power or Water." *Pediatrics* 117 (2006): s369-374.

Beatty, Mark E., Scot Phelps, Chris Rohner, and Isaac Weisfuse. "Blackout of 2003: Public Health Effects and Emergency Response." *Public Health Reports* 121 (2006): 36-44.

- The heavy dependence of modern infrastructure on electricity can lead to public health effects when power is lost
- Four of 75 hospitals in New York City were temporarily without electricity (up to 2 hours and 45 minutes)
- Patients presented to hospital emergency departments to access electricity to power their medical devices

Bernard, M & Matthews, P "Evacuation of a maternal-newborn area during Hurricane Katrina," *MCN* (2008): 33, 213-223.

- Neonatal nurses perspective on responding to the challenges of Hurricane Katrina
- Hospital disaster plan includes 'response' teams and 'relief teams'
- Previously made plans with other facilities to accept patients never came to pass because of the chaos surrounding the evacuation process
- NICU babies and well mothers and newborns were prioritized by the hospital for first evacuation
- Challenges in providing nursing care included complete loss of electricity and generator power and extreme heat, loss of water and sewer service, lack of food, threat of danger from looters, and psychological impact

Bowers, Paula J., Margaret L. Maguire, Patricia A. Silva, and Rhonda Kitchen. "Everybody Out!" *Nursing Management* Apr. 2004: 50-54.

- Disaster plans provide the illusion of preparedness, while drills offer participants an opportunity of learn the nuances of a disaster plan
- Staff evacuated patients in the intensive care units first
- Improvisation during the disaster following the loss of electrical power included patient ventilation using intermittent positive-pressure breathing machines, monitoring electrocardiograms of unstable patients using defibrillators, titrating IV rates using IV flow-rate devices, using PDA's and cell phones as light sources, using piston syringes for suctioning
- Normal procedures for receiving patients were ineffective as fax machines, copy machines and telephones were not working

Campese, Claudia. "Preparation Experience and Aftermath of Hurricane Floyd." *AORN Journal* July 2000.

Chabin, Michele. "NICU 'Code Red' " *The Jewish Week*. 05 Mar. 2008 Accessed 29 May 2008 <http://www.thejewishweek.com/viewArticle/c40_a4812/News/Israel.html>.

Cocanour, Christine S., Steven J. Allen, Janine Mazabob, John W. Sparks, Craig P. Fischer, Juanita Romans, and Kevin P. Lally. "Lessons Learned From the Evacuation of an Urban Teaching Hospital." *Arch Surg* 137 (2002): 1141-1145.

- Evacuation of a hospital is rare, but has been reported in cases of riot, earthquake, internal flooding and hazardous material spill
- Rarer still is evacuation without power
- Memorial Hermann and Memorial Hermann Children's Hospital are a 450 bed adult and 150-bed children's tertiary referral teaching hospitals at University of Texas with 84 level II and III neonatal ICU beds

- Rising water submerged the hospital's electrical switchgear, and all other mechanical electrical and plumbing system (generators on 2 but without switchgear, they were unable to provide emergency power to the hospital)
- Patient Care issues: Many ventilators did not have batteries, so had to switch to using ambu bags. The vents that had battery packs lasted only 2 hours
- Intermittent positive pressure breathing machines that usually run on air were used to ventilate, but oxygen was used instead, leading to a depletion of oxygen
- Infants in the NICU were kept warm by using chemical perineum pad and skin to skin contact

Dolan, Margaret A., and Steven E. Krug. "Pediatric Disaster Preparedness in the Wake of Katrina: Lessons to Be Learned." Clinical Pediatric Emergency Medicine (2006): 59-66.

Ewing, Bonnie, Susan Buchholtz, and Richard Rotanz. "Assisting Pregnant Women to Prepare for Disaster." MCN 33 (2008): 99-103.

- In geographic areas prone to natural disasters it is important that written prenatal records be retained by the pregnant woman
- Emergency birthing information should be provided to the pregnant woman if the possibility of birth without a healthcare provider present could occur
- In the era of terrorist threats and natural disasters maternal child nurses need to expand their roles and work collaboratively to improve the emergency care of pregnant women

Ford, Ellen, and Terry Lucas. "Multiple Moves During Renovation: Opportunities Presented and Lessons Learned." NACHRI. Accessed 29 May 2008

<<http://www.childrenshospitals.net/AM/Template.cfm?>>.

- Communication during patient movement is the key to a smooth move

Franck, L, Epstein, B. & Adams, S. "Disaster Preparedness for the ICN: Evolution and Testing of One Unit's Plan" Pediatric Nursing 19 # 2 (1993): 122-127.

- Emergency situations most often involve loss of power due to failure of backup systems
- Flexibility and redundancy in supplies, personnel roles, and other backup systems offer the greatest opportunity for infant survival under emergency conditions
- For the purposes of evacuation, the least sick patients would be evacuated first
- Suggested Emergency Supplies are provided in a table format
- Contents of "Patient Emergency Crates" are provided
- Suggested three issues in unit evacuation: supply assembly, preparation of the critically ill infant for evacuation, and testing of the plan

Ginsberg, Harley G. "Sweating it out in a Level III Regional NICU: Disaster Preparation and Lessons Learned at the Ochsner Foundation Hospital." Pediatrics 117 (2006): s375-380.

- 25 neonates on the 10th floor of an 11 story hospital (many on mechanical ventilation), physically moved to PACU on the 2nd floor without windows
- Care teams divided into A & B (Team members reminded to bring in personal supplies—non-perishable food, water [1 gallon per person per day], blankets, pillows, sheets, mattress, flashlight with batteries, medications, toiletries, extra clothes, radio or small battery-powered television, and pocket change. Family members were discouraged from coming to the hospital but were accommodated if no other options available

- Wireless phones [Spectralink] were distributed, picture IDs to be worn at all times for employees, nonmedical personnel tagged with color-coded identification bracelets

Haeuser, Jamie L. "Hurricane Babies: the Experience of a Receiving Hospital after Katrina." Public Administration Review (2007): 143-146.

**Hillier, Simon C., William L. McNiece, Tammy Brooks, Marnie Sieber, George Sheplock, and Leigh Latham. "Lessons Learned From an Operating Room Emergency Evacuation Drill." APSE. Fall 2006. Riley Hospital for Children, Indianapolis, IN. Accessed 29 May 2008
<http://www.apsf.org/resource_center/newsletter/2006/fall/05drill.html>.**

Hogan, Catherine. "Responding to a Fire at a Pediatric Hospital." AORN Journal April 2002.

- In a hospital disaster, each patient must be accounted for along with any family members or friends visiting when the disaster occurs
- Hospital for Sick Children, Toronto, Canada had an explosion in a high voltage power transformer with a subsequent fire that precipitated an evacuation of the NICU, Critical Care Unit, cardiac unit and remaining floors on the south side of the hospital
- Horizontal evacuation occurred to the north side of the building
- 9 of 29 patients accepted and transferred to Mt. Sinai hospital, a level three nursery with RN, RRT and MD
- Remainder horizontally evacuated. Nine supported in five OR's (Oxygen and thermal regulator support were available)
- Contingency plans for total communication failure used (messengers, telephones, portable radios, cellular telephones, point to point private lines and satellite communication systems)
- "Members of the media are the most important link between a disaster site and the public because they can be used to create a positive witness environment"

Hoyt, K S., and Ann E. Gerhart. "The San Diego County Wildfires: Perspectives of Healthcare Providers." Disaster Management & Response 2 (2004): 46-52.

- Two large hospitals with special patient populations were threatened by rapidly approaching fires and had to plan for total evacuations in a very short time frame
- Evacuation ordered by San Diego County of Disaster Preparedness but each hospital was responsible for evacuating their patient population
- NICU patients needed to be transferred in a life-support environment with specially trained staff in two hospitals, staff were pooled and plan was to keep all patient populations together on the USNS Mercy

Johnston, Carden, and Irwin Redlener. "Pediatricians Providing Sophisticated Care under Extreme Conditions." Pediatrics 117 (2006): s355-356.

- "How do we assimilate all of those [disaster] experiences into our lives to an advantage for children who will be impacted later?"

Johnston, Carden. "Critical Concepts for Children in Disasters Identified by Hands-on Professionals: Summary of Issues Demanding Solutions before the Next One." Pediatrics 117 (2006): s458-460.

- Disaster plans for children should include regional capacity and the likelihood that children may have to be moved a significant distance to assure proper care
- Public and private healthcare resources need to be highly coordinated to best serve the needs of children in disasters (persistent disconnect between federal and private efforts)
- Financial access to healthcare services for children must be available rapidly during a major emergency

- Pediatricians should take an active role in helping families prepare for disasters
- Focus attention on the pediatric workforce
- Effective communication systems are essential

Mani, Sandhya D. "Code Gray: a Resident's Personal Account from Children's Hospital of New Orleans." *Pediatrics* 117 (2006): s386-388.

Minnick, Jody. "Small and Smaller." *Air Medical Journal* 25 (2006): 122-123.

- Dilemma to transport teams when FEMA seized aircraft and emergency medical service vehicles

Mulligan, K.S and L.Z. Webb "Developing an Evacuation Procedure for a Nursery Complex" *Neonatal Network* 6 #6 (1988) 47-52.

- Developed procedures for evacuation in case of fire (assess fire zones and identify the safest flow between zones)
- Suggest identifying available personnel, clarifying roles and responsibilities
- List responsibilities for nursing team leaders and nursery physicians
- Identified activities to prepare infants for evacuation.
- Suggest that intermediate care babies should be evacuated first

Nazzal, Nasouh. "Saqr Hospital in Ras Al Khaimah Evacuated After Fire." *Gulfnews.Com*. 26 May 2008. Accessed 29 May 2008 <<http://archive.gulfnews.com/nation/General/10216223>>.

"Neonatal Evacuation Report from New Orleans." *Free Republic* (2005). Accessed 29 May 2008 <<http://www.freerepublic.com/focus/f-news/147526/posts>>.

"Organizing a NICU for Multiple Moves." *NACHRI*. Accessed 29 May 2008 <<http://www.childrenshospitals.net/AM/PrinterTemplate.cfm>>.

Orlando, Susan, Marirose L. Bernard, and Pamela Mathews. "Neonatal Nursing Care Issues Following a Natural Disaster." *Journal of Perinatal & Neonatal Nursing* 22 (2008): 147-153.

- Planning and education are of utmost importance, and disaster education and training are essential for all nurses
- Supporting high-risk infants without the aid of technology requires a back-to-the-basics approach
- Perinatal units in the wake of a storm often experience overcrowding and the need for additional resources, as women in the last weeks of pregnancy seek refuge before the storm
- Details for neonatal intensive care unit disaster plans should include specific instructions on how to deliver life-saving therapies for technology-dependent infants when electrical power and medical gases are disrupted
- Stress of evacuating infants from the NICU to other parts of a hospital places patients at risk
- No amount of preplanning can prepare nurses for a natural disaster in which many of the care givers also become victims
- Provision of care without the aid of physiologic monitors, laboratory equipment and radiology services is a foreign concept for novice nurses and a rare event for experienced nurses
- Text messaging and sporadic Internet connections proved to be life saving links

Perrin, Keith. "Closing and Reopening of a Children's Hospital during a Disaster." Pediatrics 117 (2006): s381-385.

- 21 bed NICU at Children's Hospital of New Orleans, sits 12 feet above sea level
- Code Gray (inclement weather plan) initiated, internal website updated
- Because of magnitude of storm, plan was to implement a vertical evacuation
- Home ventilator patients moved from group home to hospital
- 3 neonates evacuated by boat
- Lack of basic utilities, deteriorating security situation and flooding
- Frequent open communication between staff and administration is of critical importance for service, safety and morale
- 26 Neonates needed evacuation (completed in less than 24 hours); evacuation coordinated by Texas Children's Hospital, 26 patients went to Baton Rouge in a medical convoy
- 72 total children evacuated
- Any new hospitals should have power plants above predicted water levels and backup generators to run all essential equipment and fuel for at least 2 weeks, along with an alternative water supply such as a well for potable water and for plumbing services

Prade, K. "Development of an NICU-Specific Disaster and Evacuation Plan-One Hospital's Experience" Neonatal Network 17 # 4 (1998) 65-69.

- Suggested importance of maintaining communication, neonatal ventilation, suction, heat, lighting, and appropriate supplies
- Suggested staff education would be enhanced by development of a training tape to include disaster plan, routes of evacuation and supplies

Rice, Karen L., Lisa S. Colletti, Sylvia Hartmann, Rose Schaubhut, and Nancy L. Davis. "Learning From Katrina." Nursing 2006 36 (2006): 44-47.

- See Lessons Learned document for suggestions

Schulz, R, C. Pouletsos & A. Combs (2008) "Considerations for emergencies and disasters in the neonatal intensive care unit" MCN, 33, 204-210.

- Article provides resources for general disaster planning
- Recommends strengthening communication methods including family member contact information, providing a designated phone line for family members of staff to call into unit, and designating a staff member to act as liaison with patient families
- Clinical suggestions for NICU nurses during emergencies and disasters is provided
- Suggestions for a emergency supply kit and scene management kit is provided
- Recommend the document "Prepare for a Disaster: Special Information for Families with Infants or anyone caring for a Newborn" (March of Dimes, 2006)

Sexton, Karen H., Lynn M. Alperin, and John D. Stobo. "Lessons from Hurricane Rita: the University of Texas Medical Branch Hospital's Evacuation." Academic Medicine 82 (2007): 792-796.

- Physicians should be aware of the evacuation processes at their own institutions and the expectations for their participation in the processes
- 427 patients evacuated in ten hours

Shrim, Steve, Rebecca Liggin, Rhonda Dick, and James Graham. "Prehospital Preparedness for Pediatric Mass-Casualty Events." Pediatrics 120 (2007): 756-760.

Shultz, Carl H., Kristi L. Koenig, and Roger J. Lewis. "Implications of Hospital Evacuation after the Northridge, California, Earthquake." *The New England Journal of Medicine* 348 (2003): 1349-1355.

Spedale, Steven B. "Caring for Displaced Neonates: Intrastate." *Pediatrics* 117 (2006): s389-395.

- Woman's Hospital in Baton Rouge, LA, received 87 neonates during Katrina
- Daily priority of this receiving hospital was to establish communication and ultimate reunion of infants and parents
- New 30 bed special care unit and a preexisting 20 bed special care nursery that had not been demolished
- The sickest neonates were evacuated to the Level III nursery closest to New Orleans and the remainder were transferred to remaining units in the state
- Difficult to obtain ground units for transport despite being the designated referral hospital
- Evacuations often happened because of personal relationships and less as part of an organized evacuation

Verklan, Terese M., Katherine Kelley, Loye Carter, and Karen Brumley. "The Day the Rain Came Down: Stranded in the NICU by Tropical Storm Allison." *American Journal of Nursing* 102 (2002): 24AA-24II.

- 79 NICU babies, with 28 on ventilator support; and power loss
- 78 babies transferred in 14 hours