Lights Out — Immersive NICU Disaster Simulation During a Power Outage

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Karen Greeley is a registered nurse for Loma Linda University Children's Hospital's neonatal intensive care unit (NICU), where she serves as a nurse managed transport specialist and the NICU disaster coordinator. Karen is involved in planning for the yearly Statewide Medical and Health Exercise, including the evacuation of a level three NICU in 2010 and functional exercise of the entire Children’s Hospital in 2011. Karen also created a design for new evacuation equipment for the premature and term NICU patient and worked to create the first Pediatric Disaster Reference Guide that bridges pre-hospital care for the sick newborn with critical care pediatric resources during a disaster. Karen was instrumental in assisting the California Association of Neonatologists in creating their new NICU Disaster Planning Toolkit.

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Dr. Czynski is a neonatologist at Loma Linda University Children's Hospital where he is in charge of disaster preparedness for the NICU and has been involved in further developing NICU-based disaster policies. Dr. Czynski is also an assistant professor of pediatrics at Loma Linda University Medical School. His research interests are in system analysis to improve disaster response and planning and team development through simulation. He obtained his medical degree from the Philadelphia College of Osteopathic Medicine, pediatric training at Virginia Commonwealth University/Medical College of Virginia, and his neonatal fellowship at Loma Linda Children’s Hospital. He sits on the graduate medical education committee for the American College of Osteopathic Pediatricians and is a content specialist for the American Osteopathic Board of Pediatrics.
Theresa Doran, RN
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Loma Linda University Children’s Hospital

Theresa is a pediatric critical care transport coordinator for Loma Linda University Children’s Hospital. She is has been a part of the transport team for 15 years. Theresa also has taken on the role of PICU Disaster Coordinator for the last five years. She has assisted in developing the pediatric surge and evacuation plans for Loma Linda University Children’s Hospital.

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Teri Reynolds has been an educator at Loma Linda University Medical Simulation Center since 2009. Teri’s past experience includes fifteen years of emergency nursing, cardiac nursing and ICU nursing. During this time her roles included staff nurse, charge nurse and educator in the Level One Trauma Center. Teri’s heart lies in simulation and education. She is a member of the Society of Simulation in Health Care, the American Heart Association and the Emergency Nurses Association.
“LIGHTS OUT”

Immersive NICU/PICU Disaster Simulation During a Power Outage
Human Response When Disaster Strikes

- Chaos
- Unorganized
- Lack of leadership
- High stress environment
- Poor decision making

Are We at Risk?

Human Hazards
- Terrorist attack, riots, bomb threats
- Labor dispute
- Technological (equipment failure)
- Weapons of Mass Destruction (WMD)
- Hazardous Materials (toxic fumes)
- Mass Casualty Bus Accident
- Active shooter
- Power Outage**(Level 1 Trauma Center)

Natural Hazards
- Tornado
- Tsunami/Hurricane
- Wild Fires
- Earthquakes
How do we Prepare Staff?

The Value of an Accurate Needs Assessment

• What do the learners know?
• What are the knowledge gaps?
• What worked? What didn’t…
Simulation Training

• Creating scenarios that mimic real life
• Tool to evaluate needs of the learner
• Debriefing to reinforce learning objectives
In the Past …
What We Thought They Knew

Red backpacks

• HICS Forms
• Nurse/Staff Roles
• TRAIN/Triage

- Infants should be wearing hats and wrapped in blankets.
- Prepare infants by affixing ID band (Bar Code Label) to hat and blanket
- Triage infant using the “Triage Guidelines for NICU Evacuation/TRAIN”
  - Place colored triage labels on hat, blanket and all THREE (3) copies of the 260N Form
  - (Labor Pool/Ancillary Helpers will assist in carrying supplies, as needed).
- Fill out a HICS “260N - Patient Evacuation Tracking Form” for each patient. There are 3 copies:
  - A copy must stay with the patient
  - A copy for the Unit Secretary (to go to the HCC)
  - A copy for the transferring agency
- Pull 1 Face Sheet of each patient and give to Unit Secretary for Master Tracking Form (HICS 255)
- Gather blank MAR for inputting current medication information
- Gather/fill the disaster backpacks, patient charts, patient labels, and shift kardex
- **DO NOT EVACUATE WITHOUT AN ORDER AND GUIDANCE FROM THE INCIDENT COMMANDER.** If ordered to evacuate the NICU by the Incident Commander:
  - Disconnect as many tubes and wires as possible.
  - Disconnect chest tubes from suction and use Heimlich valve.

Bedside Nurse (RN)
# APPENDIX B

## Emergency Bedside Go-Kit (Backpack)

**PURPOSE:** Backpacks were assembled to provide equipment necessary to maintain life-sustaining care for 12-24 hours when resources are limited.

**QUANTITY:** 25

**STORAGE LOCATION:** Each Backpack in the NICU

**MAINTENANCE:** Annually

**RESPONSIBILITY:** NICU Disaster Committee

**AID TO BAG CONTENTS:**
- Satisfying, Nutrition and Fluid Bag
- Nebulizer, Nebulizer Accessory
- Medications (All bedside or med/surg)
- Sterile supplies

**CONTENTS:**
- Full Term Mattress (1)
- Premature Mattress (1)
- Clamp (G)
- Baby Blanket (2)
- Bath Sponge (1)
- Myle Blanket (1)
- Blanket
- Gauze (1)
- Be (1)
- Neoprene (1)
- Fusing Sponge (4)
- Oxygen Tube (1)
- Diaper (2)
- Dispo Wipes (5)
- Flashlight (1)
- Notepad, Pen and Pencil
- Meal Glove (small) bag
- Hand Sanitizer (1)
- Alcohol Wipes (5)
- Tissue Pack (1)

**PAPER WORK IN ENVELOPE:**
- Maine Label (all items color)
- Triage Label (all items color)
- NICU System Assessment Form
- NICU 3GAR
- NICU BIV Flow Chart
- NICU Progress Notes
- MD Order Sheet
- IAC-Alert/Code/Resident Evacuation Tracking Form

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## HK'S 260N - PATIENT EVACUATION TRACKING FORM

**Triage Category**

**DOCTOR**

**DATE**

**DIRECTIONS**

**ACCOMPANYING EQUIPMENT/MEASURES WHICH TOOK PLACE**

**ACCOMPANYING INFORMATION**

**Triage Category**

**Date/Time**

**Location**

**Transport to Another Facility**

**Transport to Ward**

**Transport to Labor**

**Transport to NICU**

**Transport to Operating Room**

**Transport to Therapeutic Unit**

**Transport to Anxiety Unit**

**Transport to Others**

**Transport to NICU**

**Transport to Operating Room**

**Transport to Therapeutic Unit**

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**Transport to Others**
Scenario Learning Points

Environment
- Lighting
- Ventilators not working

Assess Patient
- Airway
- Breathing
- Circulation
Evacuation Learning Points

- **Leadership**: Who was the leader?
- **Supplies**: Did they pack what they need?
- **Equipment**: Did they use specialized equipment?
Infant Resuscitation
Airway Management

Positive Pressure Ventilation

Neo-Puff
Triage

- Who went first and why?
- Traditional triage vs. TRAIN

### TRAIN - Solution

Triaging by Resource Allocation for Inpatients

1. TRAIN will facilitate rapid triage of patients’ transport needs before a disaster strikes.
2. It will provide the ability to quickly and accurately request the right resources from the County in the event of an evacuation.
3. It will increase awareness and readiness for Emergency Operations across the region

#### TRAINEE Resource Allocation for IN-patients: TRAIN

<table>
<thead>
<tr>
<th>Transport</th>
<th>Care</th>
<th>Life</th>
<th>Mobility</th>
<th>Nutrition</th>
<th>Pharmacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max</td>
<td>Normal</td>
<td>Stable</td>
<td>Wheelchair/transfer</td>
<td>PO (NPO)</td>
<td>PO (PO)</td>
</tr>
<tr>
<td>N/C</td>
<td>IV/P.O.</td>
<td>PO/IV</td>
<td>IV/P.O.</td>
<td>IV/P.O.</td>
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</tbody>
</table>

**Life Support**

- Minimal = Blood or Low Flow, O2, Peritoneal Dialysis, etc.
- Moderate = Conventional Ventilator, CPAP/BIPAP/MBi-flow, Internally paced, chest tube, < 1500 grams, etc.
- Max-Unstable = Highly specialized equip., e.g., BHOX, ECMO, INO, CVVH, Berlin Heart, etc.

**Mobility**

- Transport ng = age-appropriate ng with equipment for connecting to ambulance
- Immobilized = Unable to move without special equipment e.g., neurosurgical/neonate
Triage and Tracking

• A systematic method for triaging inpatients is key to a successful evacuation
• A rational movement of patients from the inpatient unit to a staging point to transfer to another location/health care facility is necessary to move patients quickly and safely
• Traditional START system is approached in reverse by moving inpatients that are stable that will have first priority for moving off the unit
What the Learners had to Say…

• In a disaster, always check your surroundings for equipment and supplies before the lights go out

• It was a wake up call on learning my environment...things that are so familiar are taken for granted

• The disaster scenario actually really helped me to recognize that I have a responsibility to my patient. It helped me to recognize what I need to do in a disaster

• The Disaster Simulation helped me feel more prepared

Thank You

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