NCC Pediatrics Continuity Clinic Curriculum: USNS Comfort

Pre-Meeting Preparation:
Please read/review the following enclosures:

- “USNS Comfort: Care of the Sick on the Sea” *(AMSUS presentation, 2010)*
- “Profile of Pediatric Admissions to the USNS Comfort” *(Poster, 2010)*

Conference Agenda:

- Field trip to Baltimore to tour the **USNS Comfort**
- Complete USNS Comfort Quiz & Discussion Questions
  *(Discuss answers during car rides to and from the Comfort)*

Extra-Credit:

- “Practicing Internal Medicine Onboard the USNS COMFORT in the Aftermath of the Haitian Earthquake” *(Annals of Internal Medicine)*
- Fun facts about the USNS Comfort
Curare Aegra Permarinum
“Care of the sick on the Sea”

LCDR Matthew D. McLean, M.D., Ph.D.
Pediatrician, Naval Medical Center Portsmouth
Continuing Promise, 2009
Operation Unified Response - JTF Haiti, 2010
LEARNING OBJECTIVE

Understand the adaptable capabilities of the USNS COMFORT with specific focus on Operation Unified Response, JTF- Haiti
USNS COMFORT: The Ship

Ship’s Master = Military Sealift Fleet Support Command

- 894 feet long
- 106 feet wide
- Max Speed 17.5 knots
- 4 water distilling plants = 300,000 gallons/day.
- Holds 2 MH-60 helicopters
- Draft- 33 ft
- Power 3000KW (4 generators)
- Range 113,420 NM

Delivered December 1 1987
USNS COMFORT: The MTF

One of the largest trauma facilities in the U.S.

1) Full Spectrum of Medical and Surgical Services
2) 10 Operating Rooms with C-Arms
4) 1 CAT Scan suite
5) 1 Dental suite (2 OR’s)
6) Optometry and Lens Laboratory
7) Physical Therapy Center
8) Pharmacy
9) 2 Oxygen producing plants
10) Blood bank (holds up to 5000 units)
11) Angiography Suite (under construction during OUR-Haiti)
Mobile Afloat Medical-Surgical Hospital

BED CAPACITY

20 Recovery beds
80: ICU Beds
400 Immediate care
500 Minimal care
1000 Total beds
+ 40 Casualty Receiving Beds

Theoretical Capacity
PATIENT FLOW

X-RAY / BLOOD BANK

PATIENTS ARRIVING BY BOAT WILL ENTER THROUGH SIDE PORT

Federal Physician / SMACF Program, AMSUS 2010
Real Life Capability- Haiti Experience

“The hospital ship, COMFORT, is expected to arrive in Haiti, Jan 20th and will essentially provide all the assets and services of [a naval hospital] at sea”

US Fleet Forces Public Affairs 19 Jan 2010
NNS100119-18, Navy.mil
Reduced Operating Status (ROS)

- 17 Civilian Mariners (CIVMAR)
- 58 Military Medical Personnel

Full Operating Status (FOS)

- 13 January - verbal order to deploy
- 16 January – set sail, 76 ½ hrs later
  - 550 medical personnel
  - 140 non-medical personnel
  - 67 CIVMAR

- 19 January ~2200- 1st Pt aboard
COMFORT Medical Capabilities
First 72 hours.

Deployed with standard Humanitarian Civil Assistance mission capabilities.

**Surgical Staff**
- 1 orthopedic surgeon
- 1 Emergency Medicine physician
- Variety of other surgical specialties without front load of ortho-neuro-trauma
- Most had combat tour experience

**Medical Staff**
- Broad range of specialties based on HCA missions vice disaster-trauma
- Most with inpatient medicine skills

**Nursing Services**
- Wards staffed for 250 beds
- Filled 411 beds with critical care pts
- Few pediatric trained nurses
- all with adaptable RN/HM skills

Develop JMD tailored to provide medical capabilities for disaster response missions

*Federal Physician / SMACF Program, AMSUS 2010*
Admissions, discharges, deaths

USNS Comfort Operation Unified Response Haiti
Patient Admissions, Discharges, Deaths 19 Jan - 3 Mar

2nd wave providers

Project Hope

2nd group NGO, Reservists and Mental Health

Federal Physician / SMACF Program, AMSUS 2010

UNCLAS//FOUO
Pediatric ADMISSIONS

USNS Comfort Pediatric Population

Date

Pediatric Patient

2FWD PEDS

3FWD PEDS

5FWD PEDS

ICU PEDS

TOTAL PEDS

CENSUS

providers Arrive

Project Hope Arrives

2nd Group NGO's, Reservists, and Mental Health

Federal Physician / SMACF Program, AMSUS 2010
Ancillary Services
USNS Comfort  20 Jan - 28 Feb 2010

- Radiology Studies – 3,896
  - Plain film x-rays – 3,296
  - CT Scans – 482
  - Ultrasound – 118
- Prescriptions – 70,286
  - Inpatient – 64,840
  - Outpatient – 5,446
- Blood Products – 376 units
  - Red Blood Cells – 348
  - Plasma – 16
  - Platelets – 12
- Laboratory Studies – 4,257
- Physical Therapy - 1,318
- Discharge Planning
  - Key coordination between network of NGO/Haitian facilities- 16 different sites
Joint Medical-Surgical Capability

Delivered and Coordinated Care for 794 Haitan Nationals
185 patient escorts
52 Active Duty
3 Allied Troops
23 American Citizens
1057 Total Admissions

- 7 OR’s 12 hours/day
- 3 OR’s 24 hours/day
- 820 Surgeries
- 931 total procedures
16 Craniotomy 44 Spinal
33 Pelvis 676 Extremity
122 Femur Fracture surgeries

48% of pediatric patients did not require surgery

Operations
Security
Transportation
Medical-Surgical
Personnel
Supply Mgmt
Knowledge Mgmt

Federal Physician / SMACF Program, AMSUS 2010
Thank You
Profile of Pediatric Admissions to the USNS COMFORT Following the 2010 Haiti Earthquake: Lessons for Future Hospital Ship Based Disaster Relief missions.

LCDR Matthew D. McLean MD, PhD, CDR William Scothen MD, CAPT Daniel Shnorburn MD, LCDR Erika Beard-Irvine MD, CAPT Arne Anderson MD.

1 NAVAL MEDICAL CENTER PORTSMOUTH, PORTSMOUTH, VA; 2 NATIONAL NAVAL MEDICAL CENTER, BETHESDA, MD

BACKGROUND

- 12 January 2010 at 16:53:09 a 7.2 magnitude earthquake centered 15 miles SW of Port-au-Prince, Haiti results in nearly 300,000 deaths.
- 16 January, 76 hours after receiving verbal order to activate, the USNS COMFORT sails for Haiti staffed for a bed capacity of 250.
- 19 January – First patients accepted aboard. Within 7 days the COMFORT becomes the largest trauma center on the East Coast nearly doubling its originally planned bed capacity.
- 5 Pediatricians, 3 Pediatric Nurse Practitioners, 1 Pediatric Surgeon, 1 Pediatric Orthopedist, 1 Pediatric Plastic Surgeon, 1 Pediatric Radiologist and 1 Pediatric Anesthesiologist are part of the initial crew of 757 for this surgically focused Disaster Relief Mission.

OBJECTIVE

- Define pediatric resource utilization to assist in future resource related disaster relief planning.

INCLUSION CRITERIA

- All pediatric patients 17 years old or less, admitted to the USNS COMFORT from 19 January 2010 through 27 February 2010.

DESIGN

- 100% Retrospective Chart Review

VARIABLES

- Age distribution, Number of PICU admissions, Time to first surgery, Number not needing surgery and reason, Blood transfusion rate, Injury profile with underlying causation

SETTING

USNS COMFORT Hospital Ship off the coast of Port-au-Prince, Haiti during the Haitian earthquake disaster relief mission 2010

RESULTS

1. 224 (28.5%) of the 787 total humanitarian admissions were pediatric patients. (Figure 1 and 2).
2. Pediatric census peaked at 126 patients on 29 January prior to arrival of additional pediatric providers and nursing staff from Project Hope. Initial limited staff spread over 3 separate wards with a peak single ward census of 50 patients. (Figure 2).
3. 156 (69%) of pediatric admissions were classified as quake related injuries. These patients were significantly older (9.2 vs 5.5 yrs) and admissions longer (10.4 vs 8.2 days) than non-quake related admissions. (Figure 3).
4. 167 (75%) of pediatric admissions were for trauma related injuries. These patients were significantly older than those admitted for medical reasons (9.53 vs 3.25 years. (Figure 3).
5. A Bimodal Age Distribution of pediatric patients was observed with peak admissions for infants <1 year and children 12 years of age. (Figure 4).
6. The anatomic location of injuries profile in pediatric patients admitted to the COMFORT was similar to that seen at field hospitals during other earthquake disasters (Figure 5).
7. Only 113 patients (51%) required surgery and 68% of these had their 1st procedure in one day or less (Figure 6).
8. 48% of the patients not requiring surgery were evaluated by a surgeon although 35% could have been treated ashore had basic plain film radiology services been available before transfer to the ship. 25% had already been treated prior to transfer or had an inoperable chronic disease unrelated to the earthquake (Figure 7).
9. Fifty-six patients (25%) were admitted to the PICU, the majority (44%) for non-quake related (Figure 8) and non-traumatic injuries. (Figure 9).
10. A CBC was obtained on 106 patients (47%) with no relationship to type of injury. The average hemoglobin concentration (9mg/dL) was identical across injury profile groups. (Figure 10).
11. The packed RBC per patient index was comparable to that seen in Operation Iraqi Freedom using the OIF Mass Casualty Resource Assessment. (Figure 10).

REFERENCES


CONCLUSIONS

1. Despite the challenges in transferring patients to a ship based hospital platform, the percentage of pediatric patients and the overall injury profile was similar to that seen at land based hospitals during previous earthquake disasters. This should be considered when planning resources for future missions.
2. Pediatric providers were integral in supporting the surgical team effort by managing most of the pre- and post-surgical pediatric care on the wards allowing surgeons to focus efforts in the operating suite. This hospitalist approach contributed to the minimal delays seen from time of admission to first surgical procedure despite the initial overwhelming influx of patients.
3. Manning guidelines for future disaster relief missions should include pediatric intensivists given an expected early surge and sustained PICU census with a step down area to more efficiently utilize limited critical care resources.
4. Future studies should evaluate the referral process to the COMFORT during disaster relief missions to optimize utilization of its advanced level 3 medical capabilities and maximize support available for referring field hospitals.
USNS Comfort Quiz

Some questions are based on the readings; some will need to be completed during the tour.

1. What day had the most admissions during the Haiti operation?

2. What day had the highest census in the Haiti op? Highest pediatric census?

3. How many football fields long is the Comfort?

4. How fast is the max speed of the Comfort when translated to miles per hour for a car?

5. Name a type of Navy vessel that has a max speed faster than the Comfort?

6. Name a type of Navy vessel with a max speed slower than the Comfort?

7. What's the average water usage of a person living in DC and how does it compare to the daily water available to personnel on the Comfort when underway with a full crew?

8. If you were designing a hospital ship, where would you locate the ORs and why?

9. How many ships have been named COMFORT? What was the name of this ship before she was converted to the USNS Comfort? (Hint: Look around the mess deck walls)

10. How many hospital beds does the Comfort have? OR’s? Lifeboats? Patient elevators?
USNS Comfort Discussion Questions

You are on a humanitarian mission to a developing nation devastated by a natural disaster:

1. As a pediatrician, what diseases should you prepare for?

2. What supplies would you need?

3. Onboard, where would you set up your MTFs to triage, treat, and manage children?

4. Describe the movement of patients on the COMFORT. If a patient arrives by helo, and needs triage, decontamination, emergency care, an operation and then recovery, what areas of the ship would he pass through to accomplish all this? List and diagram below: