Critical Care A La Mode During Natural Cataclysms

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WELCOME TO THE 49TH CRITICAL CARE CONGRESS
World-Wide Threats to Health Security
World-Wide Threats to Health Security

Session Objectives

• Explore the art of war battle strategies for the next influenza mutant enemy
• Analyze anti-infective infantry artillery power to combat pandemic pathogens
• Discuss worldwide critical care preparedness to address a catastrophic contagion
• Evaluate the role of medical societies in worldwide tragedies that are knock-knock-knocking on the ICU's door
• Assess potential societal threats during pandemics
Introductions

Chaperone - Lama Nazer, BCPS, PharmD, FCCM, King Hussein Cancer Center
Moderator - Donna Armaignac, PhD, APRN, CCNS, CCRN-K, Baptist Health South Florida

Twenty-First-Century Viruses
Timothy Buchman, MD, PhD, MCCM, Emory University Hospital

Anti-infective Artillery: Are We Winning the Battle but Losing the War?
Anand Kumar, MD, FCCM, University of Manitoba

Biological Threats, Pandemic Preparedness, and Containing Contagions: How Prepared Are We?
Amesh Adalja, MD, Johns Hopkins Center for Health Security

Tragedies Depleting Critical Care Capacity
Hee Soo Jung, MD, University of Wisconsin Hospital

Critical Care A La Mode During Natural Cataclysms
Donna Armaignac, PhD, APRN, CCNS, CCRN, Baptist Health South Florida
Twenty-First-Century Viruses
Timothy Buchman, MD, PhD, MCCM, Emory University Hospital

- What will be the next influenza mutant enemy?
- Are influenza vaccines fashionably late?
- Where in the world is longer relevant
- Apocalyptic Contagion - Just Like in the Movies?
- Strategies for healthcare delivery systems response
Anti-infective Artillery: Are We Winning the Battle but Losing the War?
Anand Kumar, MD, FCCM, University of Manitoba

- Historical analyses of antimicrobial resistance patterns
- Relationship to new drug development
- Strategies to mitigate
- Consequences in future
- Acceleration anti-infective medication development
Biological Threats, Pandemic Preparedness, and Containing Contagions: How Prepared Are We?

Amesh Adalja, MD, Johns Hopkins Center for Health Security

The next plague: What do we know?

– Understand the history of viruses i.e. corona
– Describe viral pathogens characteristic global strategies
– Describe the trajectory of the novel viruses (corona) outbreak
– Project critical care needs of novel virus (corona) patients

Coronavirus Fears
Global Health & Economic Impact
Tragedies Depleting Critical Care Capacity
Hee Soo Jung, MD, University of Wisconsin Hospital

- Another mass shooting – wry really?
- Tuned out to terrorism?
- Mass shootings, Gun Violence, Health Care Responses?
- Is there a role for medical society activism and advocacy?
Critical Care A La Mode During Natural Cataclysms
Donna Armaignac, PhD, APRN, CCNS, CCRN-K. Baptist Health South Florida

- Critical care à la mode menu options during natural disasters
- Are natural cataclysms increasing incidences and severity?
No Disclosures:
Pineapples and Palm Trees
Baptist Health South Florida – 10+ Hospitals
Dense Population Service Area

Hurricane Alley
Tracks of all known Category 5 Atlantic Hurricanes
1851 and 2019
State of the Science FACT SHEET

Atlantic Hurricanes, Climate Variability and Global Warming

Figure 1: Factors conducive to increased Atlantic hurricane activity

October, 2017. NOAA.gov
Will Hurricane-related Storm Surges Change Due to Sea Level Rise?

- The vulnerability of coastal regions to storm-surge flooding is expected to increase with projected sea-level rises and coastal development.\(^1\)
- A U.S. Interagency Task Force on sea level rise and coastal flooding concluded that global sea level rose by about 0.16 to 0.21 m (7 to 8 inches) between 1900 and 2015.\(^3\)
- The task force also established plausible global sea-level rise scenarios, which range from 0.3 to 2.5 m (1 to 8 feet) by 2100.\(^3\)
- Projects a likely rise of about 0.5-1.0 m (1.5-3 feet) by 2100.\(^2\)
- Regional sea level rises along the northeastern U.S. and western Gulf coasts are projected to be 30 to 50% higher than the global mean.\(^4\)

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The Night of Terror:

Invoking the name Andrew at minimum brings back unpleasant memories, if not full PTSD. People had never experienced the wind punching at 165 miles an hour.
The 25th Anniversary of Hurricane Andrew (2017)
Survivors of Hurricane Andrew
Hurricane Research Division at NOAA-AOML

After Andrew, Florida led the world
Press

Al Diaz/Miami Herald, via Associated Press

Changes to its Approach to Hurricanes

Permission details
This image is a work of a Federal Emergency Management Agency

Permission details
This image is in the public domain because it contains materials that originally came from the U.S. National Oceanic and Atmospheric Administration
Dr. Alexander Leaf, chemist, physicist, biologist, physician, Harvard professor and chief of medicine at MGH

- Physicians for Social Responsibility (PSR) 1961 Nuclear Threats
- International Physicians for the Prevention of Nuclear War (IPPNW)
- Nobel Peace Prize 1985

“Social and man-made hazards with disastrous consequences to human health ignored in medical training.”

“Health effects of global climatic and environmental changes effect on bodies, minds, and ecosystems will be analogous to those of nuclear war, including global starvation.”

NEJM, Dec. 11, 2029
The Oceanic Sink for Anthropogenic CO2 from 1994 to 2007


https://www.aoml.noaa.gov/25th-anniversary-hurricane-andrew/
Call physicians and the broader health care community throughout the world to engage in the anthropogenic effect on human health and how to respond to future challenges.

- Higher rates of respiratory and heat-related illnesses
- Increased prevalence of vector-born and water-born diseases
- Food and water insecurity
- Malnutrition and starvation

“The latest way to make the luckiest humans in history anxious during their short stay on Earth.”

—Richard Lehman, BMJ
Global Health Security in an Interconnected World

WHO and USA - International Health Regulations 2005*
- Build capacity to detect, assess, and report events

Global Health Security Agenda (GHSA) 2014**
- Accelerate implementation and progress

DHHS, CDC, - Office of Global Affairs***

Global Health Security**** - Primarily focuses on weakest countries
- Economic implications
- Travel connections
- Foul/animal for consumption industry
- Tourism
- Preparedness US federal, state and local levels
- Preparedness National and International levels
“But as with everything else, those who cannot learn from history are doomed to repeat it.”
- George Santayana.

“In life, unlike chess, the game continues after checkmate.”
- Isaac Asimov, 1920–1992

Recurrent themes led to lessons:

- Preparedness
- Lateral thinking
- Awareness secondary problems
- Logistics
- Before, during, and after

*Evacuation plan.*
Natural Disasters

- Standard functionality of entire population.
- Different types of disasters/different plans of action.
- Hospital’s plan of action and the role.
- Strengths and weaknesses of services.
- **Evacuation plan.**
Plan, Education, Practice

The goal is to predictably orchestrate transition from "standard of care" to "sufficiency of care."

- Usual standards of care rapidly change to resource limitations.
- What’s the plan for degradation of care?
  - Access to mechanical ventilation, staffing ratios, aggressiveness of resuscitation based on probability of survival, etc.
  - Triage protocols
  - Alternative care sites
  - Evacuation plan.

Preparing the Intensive Care Unit for Disaster

Key Imperative:
Disaster preparedness activities to identify potential flaws in the current disaster plan through frequent disaster exercises. (pre, during, post)
### Intensive Care Role in Disaster Management


**Fig. 2.** ICU patient flow, conventional care: admission and discharge strain indicators with corresponding ICU admission processes, ICU quality processes, and ICU transfer/discharge processes. ICC, incident command center.

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Intensive Care Role in Disaster Management

Fig. 3. Prioritization criteria for patients considered for ICU admission. Conventional and contingency care: illustration of higher-priority and lower-priority patient “buckets” and how example patients may be placed on the prioritization “ladder.” BIPAP, bilevel positive airway pressure; BP, blood pressure; COPD, chronic obstructive pulmonary disease; HR, heart rate; ICP, intracranial pressure; Mech Vent, mechanical ventilation; RR, respiratory rate (Data from Refs.15,30–41).

Fig. 6. Prioritization/triage criteria for patients considered for ICU admission: crisis care. Illustration of inclusion and exclusion priority patient “buckets” during crisis care, and the influence of which patients are placed on the prioritization “ladder,” with ongoing scheduled reassessment for exclusion or release criteria. (Data from Refs.1,19,35–41)

Your Plan:
Triage and Allocation of ICU Resources during Catastrophic Events

- Scarce Resource Allocation ICU (SRA-ICU) Triage Team Membership and Roles
- Team Procedures
- Clinical assessment – inclusion/exclusion criteria
- Triage priority categorization
- Triage tools
- Initial assessment/re-assessment
- Triage decision makers ideally not treating clinician
- Review and Appeals
- Communication of plan inside and outside
- Resuscitation status for patients excluded from scarce life-saving resources
The composition of the SRA-ICU Triage Team consists of the following:

**Scarce Resource Allocation ICU (SRA-ICU) Triage Team Membership and Roles**

**Triage Team Physician Leader.** Ideally the leader should be a physician who is not a member of the clinical care team, but who has experience managing critical care patients either as an Internist, Sub-specialist or Surgeon. This physician could be a retired physician or still in active practice. The SRA-ICU Triage Team should use the triage protocol to determine which patients are eligible for life-saving resources. The Triage Team’s role should be limited to triage implementation, collecting data, ensuring its accuracy, and directing bedside clinicians on triage decisions.

**Critical Care or Pulmonary Physician.** For each hospital at any given time, there should be one Critical Care or Pulmonary Physician on the team to provide guidance about the management of intensive medical care and implementation of altered standards of care. Because of limited staff availability, this Physician may also need to be part of the clinical bedside care team. If there is no Triage Team Physician Leader available, then the Critical Care or Pulmonary Physician should also serve as the team leader.

**Vice President (VP) over the ICU.** This hospital VP should provide guidance on the capabilities of the organization with respect to resources, personnel, and external support. This person should have knowledge of logistics related to the acquisition and distribution of critical supplies, security, fiscal matters, internal and external communication, control of patient information, and cooperative capabilities with other health care organizations.

**Ethics Representative.** A member of the Ethics Committee should provide guidance to resolving ethical conflicts, disputes, and dilemmas. This person should have knowledge of widely accepted ethical principles and the special ethical challenges that community medical disasters and public health emergencies present. This person should ensure that ethical values are an integral part of any decision process.

**Critical Care Charge Nurse.** The Charge Nurse should provide information about nurse staffing capacity to meet additional health care service needs of patients. Nursing judgments must be reflected in the SRA team’s decisions to alter standards of care that result in the nursing staff performing duties that are normally performed by physicians, in the modification of nurse–patient ratios, and in decisions to include non-clinical staff in clinical support roles.

**Clinical Pharmacist.** The pharmacist should be aware of medication availability and shortages.

**Respiratory Charge Therapist.** The therapist should be aware of ventilator and non-invasive ventilator availability.

**Social Worker.** A clinical social worker should provide updates on the social service demands imposed on the health care organization as a consequence of pandemic influenza and involve families in the decisions about their family members who are patients.

**Pastoral Care.** A chaplain should provide regular updates on the capacity of the health care organization to address the special spiritual needs of patients and family members, especially of those patients a physician deemed ineligible to receive care that would normally be delivered.
Table 1b
Inclusion Criteria for Access to Scarce Life-Saving Resources

Patient must have NO EXCLUSION CRITERIA AND at least one of the following INCLUSION CRITERIA:

1) Requirement for invasive ventilator support (reasonable expectation of short-term use)
   - Refractory hypoxemia (SpO2 < 90% on non-re-breather mask or FiO2 > 0.85)
   - Respiratory acidosis (pH < 7.2)
   - Clinical evidence of impending respiratory failure

2) Hypotension* with clinical evidence of shock* refractory to volume resuscitation, and requiring vasopressor or inotrope support that cannot be managed in a ward setting.

*Hypotension = Systolic BP, <90 mm Hg for patients > 10 years old, or < 70 + (2 x age in years) for patients ages 1 – 10, or relative hypotension; Clinical evidence of shock = altered level of consciousness, decreased urine output, or other evidence of end-organ failure.

Table 1a
Exclusion Criteria for Access to Scarce Life-Saving Resources

1) Known “Do Not Resuscitate” (DNR) status per 64J-2.018, Florida Administrative Code
2) Severe and irreversible chronic neurologic condition with persistent coma or vegetative state.
3) Acute severe neurologic event with minimal chance of functional neurologic recovery (physician judgment). This includes traumatic brain injury, severe hemorrhagic stroke, hypoxic ischemic brain injury, and intracranial hemorrhage.
4) Severe acute trauma with a Revised Trauma Score < 2. GCS: ___ SBP: ___ RR: ___ RTS: ___
5) Severe burns with < 50% anticipated survival (patients identified as “Low” or worse on the Triage Decision Table for Burn Victims). Burns not requiring critical care resources may be cared for at the local facility (e.g. burns that might have been transferred to a burn center under normal circumstances). Score:
6) Cardiac arrest not responsive to ACLS interventions within 20-30 minutes.
7) Advanced untreatable neuromuscular disease (such as amyotrophic lateral sclerosis, end stage multiple sclerosis, or spinal muscular atrophy) requiring assistance with activities of daily living or requiring chronic ventilator support.
8) Known chromosomal or untreatable disorders that are uniformly fatal in the first 2 years of life.
9) Incurable metastatic malignant disease.
10) End-stage organ failure meeting the following criteria:
    Heart: NYHA class III or IV heart failure
    Lung: (any of the following)
    - COPD with Forced Expiratory Volume in one second (FEV1) < 25% predicted, baseline PaO2 < 55 mm Hg, or severe secondary pulmonary hypertension.
    - Cystic fibrosis with post-bronchodilator FEV1 < 30% of baseline PaO2 < 55 mm Hg.
    - Pulmonary fibrosis with VC or TLC < 60% predicted, baseline PaO2 < 55 mm Hg, or severe secondary pulmonary hypertension.
    - Primary pulmonary hypertension with NYHA class III or IV heart failure, right atrial pressure > 10 mm Hg, or mean pulmonary arterial pressure > 50 mm Hg.
    Liver: Pugh score > 7, when available. Includes bilirubin, albumin, INR, ascites, encephalopathy. Total score: ___
11) Those patients who meet “low priority” criteria (SOFA score = 0) as defined in Table 3.
### Table 2
**Sequential Organ Failure Assessment (SOFA) Score**

<table>
<thead>
<tr>
<th>Variable</th>
<th>SOFA Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PaO2/FiO2 mmHg</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 400</td>
<td></td>
<td>301–400</td>
<td>201–300</td>
<td>101–200</td>
<td>≤ 100</td>
<td></td>
</tr>
<tr>
<td>Platelets, x 10^9/μL or x 10^11/L</td>
<td></td>
<td>101–150</td>
<td>51–100</td>
<td>21–50</td>
<td>≤ 20</td>
<td></td>
</tr>
<tr>
<td>Bilirubin, mg/dL (μmol/L)</td>
<td>&lt; 1.2 (≤20)</td>
<td>1.2–1.9 (20–32)</td>
<td>2.0–5.9 (33–100)</td>
<td>6.0–11.9 (101–203)</td>
<td>&gt;12 (&gt;203)</td>
<td></td>
</tr>
<tr>
<td>Hypotension</td>
<td>None</td>
<td>MABP &lt; 70 mmHg</td>
<td>Dop ≤ 5</td>
<td>Dop 6–15 or Epi ≤ 0.1 or Norepi ≤ 0.1</td>
<td>Dop &gt;15 or Epi &gt; 0.1 or Norepi &gt; 0.1</td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Score</td>
<td>15</td>
<td>13–14</td>
<td>10–12</td>
<td>6–9</td>
<td>&lt; 6</td>
<td></td>
</tr>
<tr>
<td>Creatinine, mg/dL (μmol/L)</td>
<td>&lt; 1.2 (&lt;106)</td>
<td>1.2–1.9 (106–168)</td>
<td>2.0–3.4 (169–300)</td>
<td>3.5–4.9 (301–433)</td>
<td>&gt;5 (&gt;434) or anuric</td>
<td></td>
</tr>
</tbody>
</table>

Note: Clinicians will determine the total SOFA score for each patient by summing the scores for each variable. Dopamine [Dop], epinephrine [Epi], norepinephrine [Norepi] doses in μg/kg/min. SI units are noted in parentheses ( ).

*Adapted from: Ferreira et al., 2001. Explanation of variables: PaO2/FiO2 indicates the level of oxygen in the patient’s blood. Platelets are a critical component of blood clotting. Bilirubin is measured by a blood test and indicates liver function. Hypotension indicates low blood pressure; scores of 2, 3, and 4 indicate that blood pressure must be maintained by the use of powerful medications that require ICU monitoring, including dopamine, epinephrine, and norepinephrine. The Glasgow coma score is a standardized measure that indicates neurologic function; low score indicates poorer function. Creatinine is measured by a blood test and indicates kidney function.
Who will live and who will die?

• 48 year old female asthmatic with respiratory failure
• 52 year old male with COPD and a new pneumonia with respiratory failure
• 18 year old boy in septic shock, respiratory failure and anuria

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial Criteria</th>
<th>Priority</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Exclusion Criteria <strong>or</strong> SOFA &gt; 11</td>
<td>None</td>
<td>Do not use life-saving resources. Use other resources including palliative measures.</td>
</tr>
<tr>
<td>Red</td>
<td>SOFA ≤ 7 <strong>or</strong> Single Organ Failure</td>
<td>Highest</td>
<td>Use lifesaving resources, as available.</td>
</tr>
<tr>
<td>Yellow</td>
<td>SOFA 8 - 11</td>
<td>Intermediate</td>
<td>Use life-saving resources, as available.</td>
</tr>
<tr>
<td>Green</td>
<td>No requirement for life-saving resources</td>
<td>None</td>
<td>Use other medical management. Reassess as needed.</td>
</tr>
</tbody>
</table>

**Life-Saving Resources Triage Tool for INITIAL ASSESSMENT**

This initial assessment tool is to be used to assess patients with clinical indications for critical care. For patients already admitted to acute care, this initial assessment tool is to be used only by the Triage team. For patients presenting to the emergency department, this initial assessment tool is to be used by the emergency physician.

<table>
<thead>
<tr>
<th>Category</th>
<th>48 Hour Criteria</th>
<th>Priority</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Exclusion Criteria <strong>or</strong> SOFA &gt; 11 <strong>or</strong> SOFA 8 – 11 and increasing since last assessment</td>
<td>None</td>
<td>Discontinue life-saving resources. Use other resources including palliative measures.</td>
</tr>
<tr>
<td>Red</td>
<td>SOFA 8 – 11 and decreasing since last assessment</td>
<td>Highest</td>
<td>Continue life-saving resources, as available.</td>
</tr>
<tr>
<td>Yellow</td>
<td>SOFA &lt; 8</td>
<td>Intermediate</td>
<td>Continue life-saving resources, as available.</td>
</tr>
<tr>
<td>Green</td>
<td>No longer requiring life-saving resources</td>
<td>None</td>
<td>Discontinue life-saving resources. Reassess as needed.</td>
</tr>
</tbody>
</table>

**Life-Saving Resources Triage Tool for 48-HOUR REASSESSMENT**

This 48-hour reassessment tool is to be used to reassess patients with clinical indications for critical care. This reassessment tool is to be used only by the Triage team.
Disaster Ethics - Shifting Priorities in an Unstable and Dangerous Environment - *Duty to the Plan*

A Consensus: Everyone Agrees Collectively but No One Believes Individually*

As long as the reason of man continues fallible, and he is at liberty, different opinions will be formed - James Madison

- Even with proper disaster preparedness, clinicians experience moral distress when faced with deciding which patients will or will not receive potentially life-saving resources.

- Shift from respecting the autonomy of the patient as a primary ethical standard to a justice model seeking to provide equitable distribution or resources, resulting in the most good for the most people.


Disaster Response Solution – ICU without Borders

Irma 9/9-9/11 – ‘No’ Clinical Impact

Leslee Gross, RN, MSHA, AVP Operations; Louis T. Sereti, MD, Medical Director; Lavonne Williams, RN, Operations Director; Eduardo Martinez DeBouchet, MD, Associate Medical Director; Carlos A. Valle, RT, Telehealth Data Analyst; Donna Lee Armaignac, PhD, APN, CSNS, CCNS

Challenges

- Planning
  - Disaster Preparedness Department
    - Policy – Baptist Health has a responsibility to the community to maintain public health and safety
    - Pre-planned systems did not fail
    - No Hurricane related deaths!

- EMERGENCY DEPARTMENTS
  - 50%-100% over capacity per entity over period
  - EDs all full
  - Mobile carts in use
  - Three new roles overseeing discharges

- Solution – Not any port in a storm
  - EDs 50%-100% over capacity per entity over period
  - ICUs all full
  - Mobile carts constant use
  - eMDs – new role overseeing admissions - hospital discharges

- Telehealth Center of Excellence
  - BEACON for System
    - Flexing – Everyone was a Generalist
    - eICU cared for non-ICU patients
    - Injuries pre-hurricane – shutters etc.
    - Exponential Teamwork
    - Share and share a like and non-alike
    - What’s APP
      - Staff chose to stay!
      - Hyperbaric chamber knocked out
      - Find state facilities CO poisoning

- EMERGENCY DEPARTMENTS
  - Transfer Center-Bridge Office of the Watch
    - Bed placement
    - Patient Transports/Transfers
    - 35% pre-storm % (closed two hospitals)
    - 75% after all clear
    - Transportation of staff et al. after all clear non-emergency vehicles
    - Which docs were in ORs and when we could send cases
    - Volume of non-patients in-house
    - D/C power mechanically electrical dependent patients
    - Couldn’t send D/C’d patients home to no electricity
    - WKBH auditorium opened for discharged patient accommodation
    - FIU secondary location with telehealth remotely
    - SOP telepsych and telesstroke

- Conclusion
  - No internet or cell service
  - Remember Walkie Talkies????
  - Improved food planning
  - Garbage
  - Bathrooms
  - Create a third team ‘C’

Lessons Learned

- No Internet or cell service
- Remember Walkie Talkies????
- Improved food planning
- Shower sign
- Garbage
- Bathrooms
- Create a third team ‘C’
Disaster Preparedness Department

- Policy *Baptist Health has a responsibility to the community to maintain public health and safety*

Preparedness Level Activation

- 9/5: Level 3 monitoring and assessing
- 9/6: Level 2 - A/B teams activated
  - Teams are re-randomized planning for 4 Hurricanes per/year
- 9/7: Evacuate and close Keys hospitals
- 9/8: Level 1- Emergency Operation Incident Command Activated
- 9/9: Team A reports 0700, hurricane warning before Irma approaches
- 9/10: Irma arrives
- 9/11: Team B reports 0700 after all clear, return to level 3

Disaster Response Solution #4 – ICU without Borders

Irma 9/9-9/11 – ‘No’ Clinical Impact
Telehealth Center of Excellence
BEACON for System
Tele Critical Care was the Port in the Storm for ALL
Emergency Departments

- EDs 50% - 100% over capacity per entity over period
- ICUs all full
- Mobile carts constant use
- Tele-Intensivists – new role overseeing triaging of admissions, level of care, and hospital discharges
- Doctor’s connected XXXX% over capacity
Augmenting Critical Care Capacity in a Disaster

• Telemedicine in the Intensive Care Unit Role in Emergencies and Disaster Management
  – Communications infrastructure
  – Triaging patients to prioritize those who need the most urgent care is essential to disaster response and a potential area of improvement through telemedicine.
  – Effective emergency mass critical care (EMCC) coordinates the use of medical equipment and supplies and hospital personnel and facilities to maximize survival of the greatest number of patients.
  – Surge capacity: allocation of staff, supplies, space, structure
  – Judicious use of scarce supplemental oxygen.
  – Different mindset than critical care in day-to-day operations.
  – Tele connect to free standing locations.

• Embrace the beneficial elements of nonmedical civilian caregivers to improve patient outcome and reduce variation in rescue practices and team functionality. (J Trauma Acute Care Surg. 2018;86: 134–140.)

People – “The Community We Serve”

Circumstances utilize/consume more disaster response resources than primary casualties utilize/consume.

Special Populations

– Non-hospitalized individuals with chronic critical illness- rapid deterioration.
  • Electrical equipment, oxygen, medication
– Family of hospitalized and non-hospitalized patients.
– Critical care staff and other hospital personnel.
– Families of critical care staff and other hospital personnel.
– Protect from communicable diseases and physical harm.

Refuge for ALL: Employees and their Families
Not just *any* port in a storm

Flexing – **Everyone was a Generalist**
Tele-staff cared for non-ICU patients
Trauma related injuries pre-hurricane
– shutters etc.

- Exponential Teamwork
- Share and share a like and non-alike
- What’s APP
- Staff chose to stay!
- **Hyperbaric chamber knocked out**
- **Find state facilities CO poisoning**
- Nursing home crisis –eSNIF/post acute
Transfer Center – Bridge Office of the Watch

Bed placement

Patient Transports/Transfers
  – ^25% pre-storm % (closed two hospitals)
  – ^75% after all clear

Transportation of staff et al. after all clear non-emergency vehicles

Which docs were in ORs and when we could send cases

Volume of non-patients in-house

D/C power mechanically electrical dependent patients in our facilities in-patient and non-patient

Couldn’t send patients and non-patients home to no electricity
  – WKBH auditorium opened for discharged patient accommodation
  – Florida International University (FIU) secondary location with telehealth remotely

SOP telepsych and telestoke
Hurricane Debrief

- No internet or cell service
- Remember Walkie Talkies????
  - Need extra channels of Walkie Talkies
- Shower sign
- Garbage
- Bathroom
- Create a third team ‘C’
Improve Food Planning
No Irma Related Deaths – Why No Clinical Impact?

EOC Experience
Pre-planned systems did not fail
Not a time to think ‘outside the box’

Mobile Hospital set up in the Keys

- 9/15 – Mariner’s hospital re-opens
- 9/26 – Open field hospital at Fisherman’s hospital site

Development of Florida Perspective
Extratropical Cyclone Blizzard ‘78 ~~ Hurricane Andrew ‘92

https://youtu.be/MaVxGkt19dg

https://youtu.be/lbaA-Kt5S_o
COMMUNITY • CULTURE • COLLABORATION