Translating the Results of Hurricane Sandy Research Grants into Policy and Operations: A Workshop
Panel Session III: Hurricane Sandy Research and its Implications for Access to Care and Primary Care Policy and Operations

RESPONSE CAPACITY

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Disclaimers

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• The contents of this presentation do not necessarily represent the official views of the US Department of Health and Human Services, the Office of the Assistant Secretary for Preparedness and Response, the NYU School of Medicine, the NYC Health and Hospitals Corporation, Bellevue Hospital Center, The Fire Department of the City of New York, or any employers, affiliations, named entities, or other funding agencies or sources.
Innovating Capacity Response

• Surge response capability requirements
  – *Space, Staff, Stuff, and a System.*¹

• Describe novel solutions for acute care in disaster
  – Relevant antecedent work

Initial State

NYULMC Tisch
Hospital CLOSED
E 34th Street
ED CLOSED

Bellevue
Hospital CLOSED
E 30th Street
ED CLOSED

Manhattan VA
Hospital CLOSED
E 26th Street
ED CLOSED

1st Avenue

The National Academies of
SCIENCES • ENGINEERING • MEDICINE
Escalating Freestanding Care

Bellevue Hospital Center

EMS Transports

Freestanding Critical Care
Bellevue Hospital Center

- 12/10/2012-02/06/13
- 227 patients treated in EICU (1.8% of patients)
  - NHAMC Survey, 2013 ED critical care admission rate = 1.2%¹
- Median EICU LOS was 11.55 hours (IQR: 7.30, 16.90).
- ICU and SDU patients were dispositioned to 14 and 12 different area hospitals (18 unique entities in total).

### Indication for EICU placement

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>49</td>
</tr>
<tr>
<td>Chest Pain (with or without associated dyspnea)</td>
<td>22</td>
</tr>
<tr>
<td>Trauma</td>
<td>18</td>
</tr>
<tr>
<td>Gastrointestinal hemorrhage</td>
<td>17</td>
</tr>
<tr>
<td>Ethanol withdrawal</td>
<td>15</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>14</td>
</tr>
<tr>
<td>Respiratory complaints requiring isolation (including hemoptysis)</td>
<td>13</td>
</tr>
<tr>
<td>Atrial fibrillation with rapid ventricular rate</td>
<td>10</td>
</tr>
<tr>
<td>Diabetic ketoacidosis/hyperosmolar hyperglycemic state</td>
<td>8</td>
</tr>
<tr>
<td>Anemia</td>
<td>8</td>
</tr>
<tr>
<td>Asthma/unspecific dyspnea</td>
<td>5</td>
</tr>
<tr>
<td>Opioid overdose*</td>
<td>5</td>
</tr>
<tr>
<td>Non ST-segment elevation myocardial infarction (NSTEMI)</td>
<td>4</td>
</tr>
<tr>
<td>Congestive heart failure (CHF)</td>
<td>3</td>
</tr>
<tr>
<td>Syncope</td>
<td>3</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>2</td>
</tr>
<tr>
<td>Seizure</td>
<td>2</td>
</tr>
<tr>
<td>ST-segment elevation myocardial infarction (STEMI)</td>
<td>1</td>
</tr>
<tr>
<td>Other miscellaneous conditions (anaphylaxis, angioedema, epidural abscess, hypoglycemia, hyperkalemia, stroke, thyrotoxicosis, etc.)</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>225</td>
</tr>
</tbody>
</table>


*4 patients had associated hypothermia.

39% of patients experienced improvement in disposition status ($p<0.0001$).
In a 2-month post hoc analysis (without EICU): only 5 downgrades in 332 critical care admissions (1.5%) from ED.

An Uncertain State...

Late December 2012

NYULMC Tisch: Hospital OPENED, ED CLOSED
Bellevue: Hospital CLOSED, ED OPENED
Manhattan VA: Hospital CLOSED, ED CLOSED

1st Avenue
Urgent- and Observation-Based Care

NYU Langone Medical Center

Urgent- and Observation-Based Care

NYU Langone Medical Center

Volume By Arrival Method to UCC

<table>
<thead>
<tr>
<th>Arrival Method</th>
<th>Number</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk In</td>
<td>28,703</td>
<td>52%</td>
</tr>
<tr>
<td>Taxi</td>
<td>9,940</td>
<td>18%</td>
</tr>
<tr>
<td>Car</td>
<td>7,495</td>
<td>13%</td>
</tr>
<tr>
<td>Private Ambulance</td>
<td>4,598</td>
<td>8%</td>
</tr>
<tr>
<td>Public Transport</td>
<td>2,651</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>2,336</td>
<td>4%</td>
</tr>
</tbody>
</table>

Clinical Protocols Used in EDOS

- Abdominal Pain
- Allergic Reaction
- Asthma/COPD Exacerbation
- Back Pain
- Cellulitis
- Chest Pain
- Dehydration
- Headache
- Metabolic Disorder
- Pneumonia
- Pyelonephritis
- Syncope
- Transfusion
- Transient Ischemic Attack
- Venous Thromboembolism

1/14/13-4/22/14

55,723 UCC visits (~44,000 annualized)

15,498 (28%) hospitalized (cf. 9.3%)¹

3,167 (20.4%) of these to EDOS

2,660 (84%) EDOS patients discharged

16:27 hour mean LOS


Key Conclusions and Actions Steps

• Rapidly address acute care deficits
• Sick patients self-present
• Capture/innovate extant, usable space
  – Flexible, adaptive, scalable care systems
  – Echelons (levels) of medical care\(^1\) with linkages
    • Mobile pharmacy/medical/health units, etc.
    • Urgent Care/“Supercare” Centers
    • Freestanding Emergency Department ±911 receiving
    • (ED) Observation Units
    • Freestanding Critical Care