Leveraging Public Health Emergency Informatics During the Fungal Infections Outbreak, Tennessee—2012

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Objectives

- Describe TDH emergency informatics/applications
  - Daily operations or response

- Demonstrate use of TDH informatics/applications
  - Patient management during an outbreak of fungal infections
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Hospital Resource Tracking System

TN Countermeasure Response Network—Inventory Mngmt

TN Countermeasure Response Network—Patient Mngmt

TN Volunteer Mobilizer

TN Health Alert Network
- Hospital Resource Tracking System
- TN Countermeasure Response Network—Inventory Mngmt
- TN Countermeasure Response Network—Patient Mngmt
- TN Volunteer Mobilizer
- TN Health Alert Network
Everyday and emergency use for tracking medications, supplies, and equipment

Local implementation
- County Health
- EMS

Daily use = trained emergency work force
State Evacuation
Hospital Evacuation
Catastrophic Event
Large-Scale Outbreak
Mass Casualty
Mass Gathering
Mass Sheltering
Web based and secure
  • Production and test servers

Barcode scanning (handheld & tethered)
  • SMART triage tags
  • Driver’s license

Interoperable
  • Integrates with national patient tracking system (i.e., NDMS)
  • Testing with other local, state, federal systems
  • EDXL TEP/HL7
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Fungal Infections Outbreak

- Recognized late Sep 2012
- Related to methylprednisolone acetate (MPA) steroid injection (3 lots in TN)
- MPA from a single compounding pharmacy
- Shipped to 3 pain clinics in Tennessee
- >1,100 patient injections
  - Most were epidural and a few joints
  - Some patients had multiple injections
Changing landscape

- Contact “unreachables” on Friday, 5 Oct
- State Health Operations Center (SHOC) activation
- Contact all 1,100 starting Monday, 8 Oct
- Regional Health Operations Center (RHOC) activation

Obtaining patient data (address, phone, procedure data)

- Electronic data sparse or unavailable
- Data in charts, faxes, duplicative excel files

Immediate need for a secure, web-based system for state-wide use
Solution?
8 Oct 2012

• >100 new TNCRN users and just-in-time training deployed within 24 hours (TN, KY, NH)
• Close collaboration with Community Health Services and Regional Health Operations Centers

Goal

• Reduce morbidity via public health campaign
• Enable real-time information sharing
• Provide simple data visualization
• Support incident management decisions
Data Sharing
Public Health Follow-Up

- **Goal=Communication**
  - Understanding of risk
  - Standardized symptom questionnaires
  - Health care referrals

- **Frequency**
  - Variable (depending on triage status and new information from other states or CDC)

- **Documentation**
  - In-person (telephone or home visit) preferred
  - Certified letters with return receipt acceptable

- Everything noted in TNCRN!!!!
**Green Patient**
-no increase from baseline symptoms

**Yellow Patient**
-at least 1 new or worsening sign or symptom

**Red Patient**
-pending CSF results or MRI or hospitalization
Narrative

Patient Narrative is where public health patient encounters are documented. This documentation helps inform responders of the longitudinal encounters during the period of patient follow-up. PPetersen 6/6/2013 2252
## Reports

### Patient Search

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>ZIP</th>
<th>Date of Birth</th>
<th>Triage Status</th>
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<tbody>
<tr>
<td>Harry</td>
<td>Lubell</td>
<td>7654 Kiss Kiss Blvd</td>
<td>Memphis</td>
<td>Tennessee</td>
<td>38017</td>
<td>6/15/1972</td>
<td>Delayed</td>
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<td>Pete</td>
<td>Paulson</td>
<td>201 ILUV TNCRN St</td>
<td>Memphis</td>
<td>Tennessee</td>
<td>38017</td>
<td>11/26/1978</td>
<td>Minor</td>
</tr>
<tr>
<td>Derral</td>
<td>Meescohn</td>
<td>7654 Foodie PI</td>
<td>Memphis</td>
<td>Tennessee</td>
<td>38134</td>
<td>1/12/1967</td>
<td>Delayed</td>
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<td>Diana</td>
<td>Saur</td>
<td>1202 Extinct Circle</td>
<td>Memphis</td>
<td>Tennessee</td>
<td>38141</td>
<td>7/14/1971</td>
<td>Minor</td>
</tr>
<tr>
<td>Byron</td>
<td>Jason</td>
<td>11025 LOUIS DR SE</td>
<td>HUNTSVILLE</td>
<td>Alabama</td>
<td>35803-1007</td>
<td>Delayed</td>
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<tr>
<td>Brandon</td>
<td>Fitzgerald</td>
<td>3315 LAKE ST</td>
<td>MURFREESBORO</td>
<td>Tennessee</td>
<td>37150</td>
<td>1/3/1977</td>
<td>Immed</td>
</tr>
</tbody>
</table>
Data Visualization

![Triage Status Graph]

- **Active Patients**: 021
- **Total Patients**: 1287

![Triage Status Chart]

- **Graphs**
  - ETR
  - MCR
  - NDR
  - SCR
  - SER
  - UCR
  - KKR

- **Legend**:
  - Referred to SHOC
  - Watch and Wait
  - At Risk

- **Axes**:
  - X-axis: Dates from 10/20 to 10/28
  - Y-axis: Count from 0 to 1,400
6-week Snapshot
08 Oct – 21 Nov

- Symptom Questionnaire
  - 5 questions asked at varied frequencies
  - 2,341 surveys recorded in TNCRN

- Narrative
  - Free text description of patient encounters
  - 3,164 narrative encounters in TNCRN

- 41% of cases had a public health encounter recorded in TNCRN prior to case confirmation
We made a difference....

Patient Follow-Up Initiated

2nd Round of Follow-Up Initiated

Number of Cases

Cases Alive 31 days after first healthcare encounter
Cases with Death within 31 days after first healthcare encounter
31 Day Case Fatality Rate
44 (88%) of 50 respondents reported “satisfied or extremely satisfied”

Areas of improvement:

- Date/time stamp editing of encounters
- Editing narrative documentation
- Should have placed electronic copies of all patient documentation in TNCRN
- Should have exploited bar codes for patient charts at the central office
Public health follow-up prompted patients to seek care (reduced severe morbidity and mortality)

Aggressive public health campaign for TDH

TNCRN deployment was successful (information sharing, patient management, etc.)

Using emergency informatics in daily operations is key to rapid response

Federal funding is critical
Thanks

- **At-Risk Patient Coordination**
  - Dr. Rendi Murphree

- **TNCRN Gurus**
  - CAPT Robert Newsad, Laina Stanford, Jeff Sexton

- **Community Health Services**
  - James Milliken, Tonya McKennley

- **State-to-State Communication**
  - CDR Jay Roth, Tristan Victoroff

- **Surveillance Data Team**
  - Jennifer Ward, Andrew Wiese, Caleb Wiedeman, Ellyn Marder

- **Dozens of TDH & field staff**