WTC Health Program
NYUSOM Clinical Center of Excellence
at Bellevue Hospital Center

Denise Harrison M.D.
11-9-2011
# General Demographics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Male = 81.2%</td>
</tr>
<tr>
<td></td>
<td>Female = 18.8%</td>
</tr>
<tr>
<td><strong>Age Range</strong></td>
<td>28-86</td>
</tr>
<tr>
<td><strong>Mean Age</strong></td>
<td>48.9</td>
</tr>
<tr>
<td><strong>Language Spoken</strong></td>
<td>English = 92.2%</td>
</tr>
<tr>
<td></td>
<td>Spanish = 7.8%</td>
</tr>
<tr>
<td><strong>Percentage of Mental Health</strong></td>
<td>30.2%</td>
</tr>
<tr>
<td><strong>Percentage Referred to</strong></td>
<td>33.1%</td>
</tr>
<tr>
<td><strong>Treatment Program</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total Cohort</strong></td>
<td>2232</td>
</tr>
<tr>
<td><strong>Total Unique Patients in</strong></td>
<td>635</td>
</tr>
<tr>
<td>Treatment**</td>
<td></td>
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</tbody>
</table>

NYU Langone Medical Center
Race/Ethnicity (N=2232)

- Non-Hispanic Descent, 84.4%
- Hispanic Descent, 15.6%
- Other (0.7%)
- Black/African-American (4.4%)
- Asian/Pacific Islander (1.5%)
- Multiple/Mixed (4.6%)

NYU Langone Medical Center
Work Status (N=2232)

- 89% Employed
- 6% Retired
- 4% Unemployed
- 1% Disabled

- 87% Have Insurance
- 13% No Insurance

NYU Langone Medical Center
Percentages of Mental Health Symptoms (N=635)

- PTSD
- Depression
- General Anxiety
- Panic
- CAGE
- Social Stressors
- Suicidality

Legend:
- Individual Symptoms
- Co-Morbidity
Percentages of Patients with Diagnoses (N=635)

- Upper Airway: 31.5%
- Lower Airway: 49.9%
- Gastrointestinal: 15.2%
- Sarcoidosis: 1.0%
Percentages of Patients with Cancer Diagnoses

- Thyroid Cancer: 2.8%
- Lung Cancer: 3.5%
- Brain Cancer: 1.0%
- Skin Cancer: 2.0%
- Other Cancers: 4.1%
Treating Posttraumatic Stress Disorder in First Responders: A Systematic Review

Peter T. Haugen and Mark Evces
New York University
WTC Health Program NYU Clinical Center of Excellence
Daniel S. Weiss
University of California, San Francisco
Background

First responders:
• Paid professionals and volunteers responding to emergencies
• High levels of work demands
• Routine exposure to both physical and psychological stressors
• Unique exposure recognized in revision to PTSD in upcoming DSM-5
  - A4: “Experiencing repeated or extreme exposure to aversive details of the events...e.g., first responders collecting body parts. [italics added]”
Psychiatric outcomes in first responders

- Depression (e.g., Tak et al. 2007)
- Somatic or psychosomatic complaints (e.g., Witteveen et al., 2006)
- Chronic fatigue (e.g., Spinhoven & Verschuur, 2006)
- Difficulties with alcohol (e.g., Stewart et al. 2004)
- Posttraumatic stress disorder
Prevalence of PTSD in first responders

- No nationally representative, large scale studies

- Variable rates:
  - 7-19% in active duty police officers (Maia et al. 2007)
  - 46% in volunteer disaster workers responding to a disaster (Mitchell et al. 2004)
Estimating prevalence of PTSD in first responders

- Military population as comparison group
- National Vietnam Veterans' Readjustment Survey (Kulka et al. 1990)
  - Nationally representative
  - Years post-exposure
- ~15% full PTSD (Kulka et al. 1990)
- ~11% partial PTSD (Weiss et al. 1992)
Prevalence of PTSD in first responders

- 225,465 first responders with full PTSD
  - 15% x 1,503,100
- 165,341 first responders with partial PTSD
  - 11% x 1,503,100
- ~390,806 first responders nationally with full or partial PTSD
Goals of current systematic review

- Conduct literature review of status of treatment outcome studies for PTSD in first responders
  - Psychosocial treatment
  - Pharmacological treatment
  - Combined psychosocial and pharmacological treatments
Study inclusion criteria

- **Inclusion criteria**
  - Psychological or pharmacological intervention was delivered
  - Subjects were first responders
  - Subjects had primary diagnosis of PTSD based on DSM or ICD criteria
  - PTSD diagnosis or symptom status was chief study outcome

- **Psychosocial treatment studies**
  - Compared two active treatment groups or one active group to a nonspecific control or wait-list group

- **Pharmacological treatment studies**
  - Compared drug treatment to placebo or active comparator
Literature Review Exclusion Flow Chart
Major Exclusion Criteria Were Not Mutually Exclusive

Potential relevant articles: N=845

Articles excluded: n=21, Not in English

Articles evaluated against criteria: n=824

Articles excluded: n=807
Not a treatment study: n=672
Sample not first responders: n=629
PTSD not primary outcome: n=479

Articles included in review: n=17

<table>
<thead>
<tr>
<th></th>
<th>CBT (N = 7) Mean (SD)</th>
<th>TAU (N = 14) Mean (SD)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>CAPS</td>
<td>44.43 (14.82)</td>
<td>19.57 (15.93) <em>b</em></td>
<td>48.50 (10.81)</td>
</tr>
<tr>
<td>PCL</td>
<td>37.71 (10.70)</td>
<td>23.43 (4.12) <em>b</em></td>
<td>46.69 (12.37)</td>
</tr>
</tbody>
</table>

Intent-to-Treat Sample

<table>
<thead>
<tr>
<th></th>
<th>CBT (N = 15) Mean (SD)</th>
<th>TAU (N = 16) Mean (SD)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>CAPS</td>
<td>51.73 (17.04)</td>
<td>40.13 (25.52) <em>b</em></td>
<td>50.50 (13.30)</td>
</tr>
<tr>
<td>PCL</td>
<td>38.31 (14.60)</td>
<td>30.62 (15.14) <em>b</em></td>
<td>47.36 (12.14)</td>
</tr>
</tbody>
</table>

CBT Group (N = 6) Self-Report Measures at 3-Month Follow Up

| PCL              | 24.83 (5.91) |

*a* Posttreatment between-group effect sizes (Cohen's d) (Cohen, 1988) were calculated for significant findings and trends only.

*b, c* Posttreatment means in the same row with superscripts that differ indicate significant differences.

*d* Variable was nonnormally distributed.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Baseline</th>
<th>After 4 Treatment Sessions</th>
<th>Posttest (End of Treatment)</th>
<th>Follow-up 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PTSD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEP (n= 22)</td>
<td>0</td>
<td>31%</td>
<td>91</td>
<td>96</td>
</tr>
<tr>
<td>Wait list (n= 20)</td>
<td>0</td>
<td>35%</td>
<td>50**</td>
<td>35**</td>
</tr>
<tr>
<td>&lt;6 PTSD Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEP</td>
<td>0</td>
<td>23%</td>
<td>77</td>
<td>91</td>
</tr>
<tr>
<td>Wait list</td>
<td>0</td>
<td>30%</td>
<td>15**</td>
<td>30**</td>
</tr>
<tr>
<td>No Reexperiencing Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEP</td>
<td>0</td>
<td>5%</td>
<td>55</td>
<td>68</td>
</tr>
<tr>
<td>Wait list</td>
<td>0</td>
<td>20%</td>
<td>15**</td>
<td>20**</td>
</tr>
<tr>
<td>&lt;3 Avoidance Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEP</td>
<td>0</td>
<td>32%</td>
<td>82</td>
<td>91</td>
</tr>
<tr>
<td>Wait list</td>
<td>0</td>
<td>45%</td>
<td>60</td>
<td>40***</td>
</tr>
<tr>
<td>&lt;2 Hyperarousal Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BEP</td>
<td>0</td>
<td>14%</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Wait list</td>
<td>0</td>
<td>10%</td>
<td>20**</td>
<td>30*</td>
</tr>
<tr>
<td>Resumption of Police Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEP</td>
<td>18</td>
<td>59%</td>
<td>77</td>
<td>86</td>
</tr>
<tr>
<td>Wait list</td>
<td>25</td>
<td>60%</td>
<td>70</td>
<td>60*</td>
</tr>
</tbody>
</table>

* N = 22 for Brief Eclectic Psychotherapy (BEP) and n = 20 for wait list

** N = 19 for Wait List Control
Summary

- ~400,000 U.S. first responders with PTSD symptoms
- 845 articles; 17 focus on treatment of first responder PTSD
- 2 RCTs of psychosocial treatment
- 0 RCTs of pharmacotherapy or combined treatment
- CBT and BEP treatments are examined
- Effect sizes are large
- Based on the studies identified, treatment guidelines are questionable
Barriers to treatment research with first responders

• Duty status
  – Active-duty associated with lower levels of treatment referral and engagement

• Stigma concerns
  – Negatively evaluated by peers and/or leadership (Hoge et al., 2004)

• Changes in job status
  – Unsought, negative changes in job duties or reduced pay

• Lack of academic institution affiliation
  – First responder organizations unaffiliated, unlike Veteran Administration Health System
Recommendations

1. Begin with treatments with strongest preliminary evidence for efficacy with first responders: CBT and BEP

2. Psychosocial and pharmacological treatments identified in non-RCTs should be tested in RCTs

3. Psychosocial and pharmacological treatments represented in current treatment guidelines for PTSD need to be studied
   - Especially those validated with active duty military personnel, subject group with many similarities to first responders
Recommendations

- Focus on non-law enforcement populations
  - Majority of studies focus on law enforcement

- Assess duty status as a potential moderator during- and post-treatment
  - Duty status is associated with exposure to traumatic stressors, which may complicate treatment and attenuate outcomes
Evaluation of Respiratory Symptoms in WTC Responders

- Respiratory Symptoms Common Among WTC Responders
- Cough, Dyspnea, Wheezing are common respiratory complaints.
- Two groups: WTC responders with abnormal spirometry and WTC responders with symptoms and normal spirometry
Evaluation of Respiratory Symptoms In WTC Responders

- Over 9000 WTC responders 72% have normal spirometry results despite respiratory symptoms.

(Herbert et al EHP, 2006)
Evaluation of Respiratory Symptoms In WTC Responders

Distal Airway Function in Symptomatic Subjects With Normal Spirometry Following WTC Dust Exposure.

( Berger et al Chest 2007; 132:1275-1282)

- Evaluated 174 subjects with respiratory symptoms and normal spirometry

- Impedance Oscilometry was performed to determine resistance at 5 Hz, 5-20 Hz and reactance area.

- Forty Three patients were tested for frequency dependence of compliance.
- Testing was repeating after brochodilation
Evaluation of Respiratory Symptoms in WTC Responders

- Despite normal spirometry mean resistance at 5, 5-20HZ and reactance area were elevated.
- Resistance and reactance normalized after bronchodilation.
Evaluation of Respiratory Symptoms In WTC Responders

Conclusions

Symptomatic Individuals with WTC dust exposure and normal spirometry displayed airway dysfunction based on the following.

- Elevated airway resistance and frequency dependence of resistance determined by IOS
- Heterogeneity of distal airway function demonstrated by elevated reactance area on oscilometry and FDC
Evaluation of Respiratory Symptoms in WTC Responders

- Reversibility of these functional abnormalities to or toward normal following administration of bronchodilator.

- Since spirometry results were normal in all subjects these abnormalities likely reflect dysfunction in airways more distal to those evaluated by spirometry.

- Evaluation of distal airway when spirometry results are normal is important in evaluating occupational/environmental hazards.
Evaluation of Respiratory Symptoms In WTC Responders

Respiratory Symptoms Were associated with Lower Spirometry Results During the first Examinations of WTC Responders.

(Udasin et al JOEM January 2011, Volume 83 Issue 1 p49-54)

- Looked at 18,685 responders with dyspnea wheezing and cough (wet and dry)
- The mean FEV1 and FVC were lower for participants who reported persistent respiratory symptoms
Evaluation of Respiratory Symptoms in WTC Responders

- Responders reporting respiratory symptoms also had larger bronchodilator response.
- Responders reporting chronic persistent cough, wheezing or dyspnea at first medical examination were more likely to have lower lung function and bronchodilator responsiveness compared to those without symptoms.

Conclusion
Conclusions

This unique population allows for the study of multiple conditions such as GERD and Sleep. This includes not just respiratory and mental health, which may have diverse etiologies. Similar to most people with Occupational/Environmental Exposures WTC Responders present medical conditions.

- Aneur.
- To responders in future disasters.