Conceptualizing Exposure to Trauma and Trauma Related Disorders and Symptoms

Robert J. Ursano, M.D.
Prof/Chair
Dept of Psychiatry
Uniformed Services University

Director
Center for the Study of Traumatic Stress
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Characteristics of Traumatic Events

Individuals Exposed
- Intentional
  - assault
  - robbery
  - rape
- Unintentional
  - accident
  - MVA
  - injury

Communities/Populations Exposed
- Human Made
  - industrial acc.
  - plane crash
  - toxic exposure
- Natural
  - hurricane
  - earthquake
  - tornado
Mental Health Responses to Trauma, Disasters and Public Health Emergencies

Distress Responses

- PTSD
- Depression
- Complex Grief

Psychiatric Illness

- Sense of vulnerability
- Change in Sleep
- Irritability, distraction
- Belief in Exposure
- MUPS/MIPS
- Isolation

Health Risk Behaviors

- Smoking
- Alcohol
- Over dedication

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Organizing Principles

• Trauma as toxic exposure – 40% -??90%
  “Asbestos exposure among smokers”
  (Need to understand the toxin)

• DSM V- RDOC:
  Dimensions and Categories
  “Trauma & Stressor Related Disorders”
  (dimensions, behaviors, disorders)

• Individual and community level exposures
Hurricane Katrina (2005)
Problems 5-8 months post (N=1043)
(Traumatic Events and cascade of adversities)

Current practical problems

- Financial
- Housing
- Employment
- Services
- Insurance

Percent

N.O. City
N.O. Metro
Other locations

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Kessler et al, 2006
U.S. Army Child Neglect Rates Age 1-2 year olds, 1989-2004

Rate per 1,000


Years

Rate per 1,000

1 to 2 Years

McCarroll J et al CSTS USU, 2005
Psychosocial Responses to Trauma and Disaster

- Horror
- Anger
- NOT Panic
- Resilience/altruism
- Fear
- Sleep problems
- Increased Alcohol and Smoking Use

- Grief
- Anger at government
- Blaming
- Scapegoating
- Social isolation
- Demoralization
- Loss of faith in social institutions
- Guilt
- Paranoia
Hurricane Katrina (2005)
Stress Reactions at 5-8 months (N=1043)
(Anger/aggression/irritability)

Kessler et al., 2006
Post Disaster Community Mental Health Surveillance

- Distress
- Psychiatric Illness/Symptoms
- Health Risk Behaviors
- Risk Perception
- Safety Perception
- Changes in behavior
- Preparedness Behaviors

Ursano, Fullerton, Raphale, Weisaeth
Txtbook of Disaster Psychiatry 2007
Those with difficulty balancing home & work were 2.5 times more likely to have PTSD &/or Depression

(9 mos. post-hurricanes)

After adjusting for:

- Injury/damage
- Overall work demand

PTSD: Wald Chi Sq.=13.5, OR = 2.5, p=0.002, CI=1.54-4.17
DEP: Wald Chi Sq.=11.6, OR = 2.5, p=0.006, CI=1.48-4.26
Cost of Lost Productivity Due to Depression

- 80% of lost productive time costs are due to reduced performance while at work (e.g., fatigue, how long to start work after arriving)
- 20% due to Absenteeism

Stewart, WF et al, JAMA, June 2003
Foster Resilience

• Optimism
• “Recovery Skills”
• Self regulation of emotions
• Attachment/Social Support
• Altruism (?)
• Active vs passive responses (instrumental)

Charney AJP 2004
Collective Efficacy and Probability of PTSD

Probability of Having PTSD (%) vs. Collective Efficacy at Community Level

- Low Injury
- High Injury

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Post-Traumatic Stress Disorder (PTSD)

- PTSD not uncommon after many types of traumatic events
  - Examples: Motor vehicle accidents and industrial explosions

- Perhaps nearly all have the acute form at some point
  - Can develop in people without psychiatric history
  - Rapid recovery is the norm
Figure 3. Traumatic stress responses over time. Line 1 represents acute stress symptoms that resolve with time; 2 depicts ASD that also resolves; 3 is ASD that progresses to PTSD; and 4 shows delayed onset PTSD.
Median prevalence of PTSD in DSMV-Experiencing categories within 12 months post-trauma (including Combat)
Median prevalence of PTSD by intentional and unintentional trauma type categories within 12 months post-trauma (without Combat)
ANNUAL NUMBER OF TBIs

Estimated Average Annual Number of Traumatic Brain Injury-Related Emergency Department Visits, Hospitalizations, and Deaths, United States, 2002–2006

52,000 Deaths

275,000 Hospitalizations

1,365,000 Emergency Department Visits

??? Receiving Other Medical Care or No Care*

An estimated 1.7 million TBIs occur in the United States annually.

Of the 1.7 million TBIs occurring each year in the United States, 80.7% were emergency department visits, 16.3% were hospitalizations, and 3.0% were deaths.

* Data for this category are not included in this report. See “Limitations” in Appendix B for more information.


www.cdc.gov/TraumaticBrainInjury

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Postconcussive Symptoms (PCS)

**Physical**
- Headache
- Dizziness
- Balance problems
- Naus/Vomiting
- Fatigue
- Visual Disturbances
- Sensitive to Light/Noise
- Ringing in ears

**Emotional**
- Anxiety
- Depression
- Irritability
- Mood lability

**Cognitive**
- Slowed processing
- Decreased attention
- Poor Concentration
- Memory Problems
- Verbal dysfluency
- Word-finding
- Abstract reasoning

Jaffee et al DVBIC 2008
Age at First TBI
(in AAS Q2-Q4)
## TBI and MDx: Multivariate model predicting suicidality\(^1\) (A*S)

<table>
<thead>
<tr>
<th></th>
<th>Lifetime Suicide Ideation</th>
<th>Lifetime Suicide Plan</th>
<th>Lifetime Suicide Attempt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OR [95% CI]</strong></td>
<td><strong>OR [95% CI]</strong></td>
<td><strong>OR [95% CI]</strong></td>
<td></td>
</tr>
<tr>
<td>Antecedent TBI(^1)</td>
<td>1.7 [1.4-2.0]</td>
<td>1.9 [1.5-2.5]</td>
<td>1.6 [1.2-2.2]</td>
</tr>
<tr>
<td>Antecedent TBI(^2) (full model)</td>
<td>1.4 [1.2-1.6]</td>
<td>1.6 [1.1-2.1]</td>
<td>1.3 [0.9-1.8]</td>
</tr>
</tbody>
</table>

\(^1\) Multivariate model predicting suicidality outcomes with TBI (0,1,2) controlling for all demographics and interaction between "not entered army yet" and "birth place"; controlling for years since ideation for outcomes among ideators

\(^2\) As above and controlling for mental disorders

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Barriers to Seeking Care and Mental Health Risk*

- I would be seen as weak: 65%
- My unit leadership might treat me differently: 63%
- Members of my unit might have less confidence in me: 59%
- My leaders would blame me for the problem: 51%
- It would harm my career: 50%

*Participants were asked to “rate each of the possible concerns that might affect your decision to receive mental health counseling or services if you ever had a problem.”


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Is Stigma Unique to Military?

Lack of perceived need
Perceived lack of effectiveness
Want to solve on own
Unsure where to go
Fear of forced hospitalization
Stigma

Agree or Strongly Agree, %

Men
Women

Maybe Less Than One Might Think…!
What is PTSD?

1) The inability to “digest” early stress symptoms, e.g. impaired “repair” or “return to stasis”

2) Altered “set point”

3) The “glue” that makes the symptoms “stay” or “cluster together”
Oklahoma City Terrorist Attack (at 6 months)

34% PTSD
25% Depression

40% Never had a Psychiatric Problem in the Past

North et. al., JAMA 1999
PTSD: an Autoimmune Disorder
Exposure to Death and the Dead
Identification and PTSD Symptoms

Ursano et al. AJP, 1999
What is PTSD?

4) The ability to remember AND the ability to forget are important.

5) Fear organized behaviors.

6) Toxic Exposure (Event Related) Disorders – cue related versus autonomous –”Stressor related”
Who Does NOT get PTSD

Reduced Perrhinal Cortex Activity (vs Normals) Leads to Recovery After Trauma Exposure
Lifetime Probability of Treatment Contact (USA)

7% contact within year of PTSD onset and 12-year median delay to first treatment contact

 Patients Making Treatment Contact, %

- Panic Disorder: 95%
- Dysthymic Disorder: 94%
- Bipolar Disorder: 90%
- Major Depression: 88%
- GAD: 86%
- PTSD: 65%

GAD, generalized anxiety disorder.
Back Up
<table>
<thead>
<tr>
<th>Pre</th>
<th>Agent: Anthrx/Terror</th>
<th>Vector: Terrst/Mail</th>
<th>Population: Person</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-Premedication</td>
<td>-Airport Screening</td>
<td>Preparedness</td>
</tr>
<tr>
<td></td>
<td>-vaccination</td>
<td></td>
<td>Behaviors</td>
</tr>
<tr>
<td></td>
<td>-Air detection sys</td>
<td></td>
<td>-Participation in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vaccination</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Information/plan.</td>
</tr>
<tr>
<td>During</td>
<td>-Specific medicaion rx</td>
<td>-Security Detectors</td>
<td>Response Behaviors</td>
</tr>
<tr>
<td></td>
<td>-supportive rx</td>
<td></td>
<td>-Quarantine</td>
</tr>
<tr>
<td></td>
<td>-Masks/Cover</td>
<td></td>
<td>-Evacuation</td>
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<td></td>
<td></td>
<td></td>
<td>-Grief Leadership</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Social Distancing</td>
</tr>
<tr>
<td>Post</td>
<td>-rehabilitation</td>
<td>-Justice system</td>
<td>Recovery Behaviors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Help seeking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Specific Rx’s</td>
</tr>
</tbody>
</table>
DSM 5 Key Points
Persistent Complex Bereavement Disorder

- Conditions for Further Study
- Potential compelling clinical need for the category
- Inclusion in the Appendix will facilitate research
- Substantial empirical evidence, but there remain concerns that need further resolution (e.g. Onset > 12 months after death of loved one)
- Considerations of benefit vs. potential harm
Figure 1
Rates of mental health service utilization in the U.S. Army in the past 12 months

General medical doctor
- GMD only
  - 3% \(^a\)
  - 14% \(^c\)
  - N=13,499
- GMD and MHP
  - 3% \(^a\)
  - 14% \(^c\)
  - N=13,162
- MHP only
  - 5% \(^b\)
  - 22% \(^c\)
  - N=21,800

Mental health professional
- GMD, MHP, meds
  - <1% \(^b\)
  - 2% \(^c\)
  - N=1,912
- MHP and meds
  - 3% \(^a\)
  - 14% \(^c\)
  - N=13,167
- Meds only
  - 3% \(^b\)
  - 15% \(^c\)
  - N=14,975

Prescribed medications

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\(^a\) Army sample, N=462,685; Army soldiers receiving any mental health service, N=97,283; Army soldiers receiving no mental health service, N=365,702 (79% of Army service members). GMD, general medical doctor; MHP, mental health professional; meds, prescription medication for depression, anxiety, or sleeping problems. All reported Ns are weighted.

\(^b\) Among members of the U.S. Army

\(^c\) Among members of the U.S. Army who were using services
DSM 5 Key Points

Chapters

- Anxiety Disorders
- Obsessive Compulsive and Related Disorders
- **Trauma and Stressor-Related Disorders**
- Dissociative Disorders
DSM 5 Key Points
PTSD

• PTSD – 4 vs 3 symptom clusters (Avoidant & Negative/numbing/withdrawal)-1,1,2,2
• 24 vs 17 possible Sxs
• Dissociative Subtype – “with”
  • Persistent or recurrent depersonalization or derealization
  • Supported by clustering of symptoms and different imaging findings PFC and Amygdala (d/u vs u/d) (Lanius)
• No present data on differential treatment
DSM 5 Key Points

ASD

• Five Categories
• Nine of 14 symptoms required
• Describes severe acute posttraumatic stress reactions in initial month
• No presumption that it is predictive of PTSD because no evidence that it (or any permutation of ASD) is adequately predictive
• Dissociation not required
# mTBI and Health

## LOC vs Other Injury significant

<table>
<thead>
<tr>
<th>Health Measures Past-Month</th>
<th>mTBI &amp; LOC (%) (n=124)</th>
<th>mTBI &amp; MS altered (%) (n=260)</th>
<th>Other Injury (%) (n=435)</th>
<th>No Injury (%) (n=1706)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor general health</td>
<td>12.6*</td>
<td>6.6</td>
<td>6.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Sick-call &gt; 2 past month</td>
<td>42.5*</td>
<td>32.8</td>
<td>28.9</td>
<td>19.7</td>
</tr>
<tr>
<td>Missed work &gt; 2 X past month</td>
<td>23.3*</td>
<td>15.6</td>
<td>14.6</td>
<td>7.3</td>
</tr>
<tr>
<td>High Physical Symptom Score - PHQ-15 ≥ 15 (range 0-28)</td>
<td>24.8*</td>
<td>16.1</td>
<td>11.3</td>
<td>5.1</td>
</tr>
</tbody>
</table>

*Hoge et al, AJP 2007*
# mTBI and Post Concussive Sxs

<table>
<thead>
<tr>
<th>Other Post-Concussive Symptoms</th>
<th>mTBI with LOC (%)</th>
<th>mTBI with Altered MS (%)</th>
<th>Other Injuries (%)</th>
<th>No Injury (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory problems</td>
<td>24.6*</td>
<td>16.2</td>
<td>13.7</td>
<td>7.4</td>
</tr>
<tr>
<td>Balance problems</td>
<td>8.3*</td>
<td>6.7*</td>
<td>2.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Ringing in the ears</td>
<td>23.5*</td>
<td>17.9</td>
<td>14.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Concentration problems</td>
<td>31.4*</td>
<td>26.0*</td>
<td>18.1</td>
<td>10.2</td>
</tr>
<tr>
<td>Irritability</td>
<td>56.8*</td>
<td>47.6*</td>
<td>36.8</td>
<td>24.7</td>
</tr>
</tbody>
</table>

Hoge et al, AJP 2007
Psychiatric Responses to Trauma

- Anxiety
- PTSD
- Depression
- Resilience

Distress Responses

- Change in Sleep
- Decrease in Feeling Safe
- Isolation (staying at home)

Mental Health/Illness

- Change in travel
- Separation anxiety

Health Risk Behaviors (changed behavior)

- Smoking
- Alcohol
- Over dedication
Disaster Behaviors
Before, During and After

- Preparing behaviors
- Health Care Seeking
- Convergence
- Overdedication
- “See Something Say Something”
- Avoiding others (London Bombing)
- Stigmatizing
- Staying home (separation anxiety, economic impact)
Response Behaviors and inconvenient aspects of human behavior

- Evacuation
- Shelter in place
- Convergence
- Migration
Locations of Katrina/Rita Applicants from Louisiana, Mississippi, Alabama, and Texas as of 10/31/05

Data provided by Recovery Division IA Management Cell

The figures contained on this map are based on the best available data.

**Cities with less than 5 applicants not shown**

Applicants per city
- Less than 1,000
- 1,000 - 5,000
- 5,000 - 10,000
- Greater than 10,000

Legend

DR-1604 Mississippi
DR-1606 Texas
DR-1605 Alabama
DR-1603 and DR-1607 Louisiana

MapID c7a3ad51d79
<table>
<thead>
<tr>
<th>Disorder</th>
<th>PTSD</th>
<th>MI</th>
<th>Mult.Scler</th>
<th>Back Pain</th>
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</thead>
<tbody>
<tr>
<td>The Glue Self Repair</td>
<td>The Glue Self Repair</td>
<td>ICU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal Nightmares</td>
<td>Withdwal Nightmares</td>
<td>Nitroglycerin</td>
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<td></td>
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<tr>
<td>Marital Job</td>
<td>Marital Job</td>
<td>Walker Job Couns.</td>
<td></td>
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<tr>
<td>Job “phobic”</td>
<td>Job “phobic”</td>
<td>Lg Trm Plan and Asst</td>
<td></td>
<td></td>
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<tr>
<td>Depression Subst Abuse</td>
<td>Depression Subst Abuse</td>
<td>Hypertension Hyper chol.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute, Chronic, Delayed Recovering</td>
<td>Acute, Chronic, Delayed Recovering</td>
<td>Life Style Changes (smoking)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Trauma and Disasters

Human Made
- Industrial Accident
- MVA, Rape, Fall
- War
- Terrorism

Natural
- Hurricane
- Epidemic
### TBI and MDx: Population Attributable Risk Proportion (PARP) (A*S)

<table>
<thead>
<tr>
<th>Eliminating TBI in a model controlling for TBI but not mental disorder</th>
<th>Lifetime Suicidal Ideation</th>
<th>Lifetime Suicide Plan</th>
<th>Lifetime Suicide Attempt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.293</td>
<td>0.378</td>
<td>0.304</td>
</tr>
<tr>
<td>Eliminating TBI but not mental disorders in a model controlling for both</td>
<td>0.202</td>
<td>0.293</td>
<td>0.180</td>
</tr>
</tbody>
</table>

1 Models all control for person-years and demographics

- 20-30% of all suicidality in the AAS would be reduced if we were able to eliminate TBI