Head Injury and PTSD in Veteran and Civilian Women Who Have Experienced Intimate Partner Violence: Implications for Screening and Intervention

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Overview of Presentation

• Intimate partner violence as a cause of head injuries and traumatic brain injury (TBI)
• IPV-related TBI’s associations with mental health (i.e., PTSD) and VA healthcare use
• Role of head injuries in recovery from PTSD among interpersonal trauma survivors
• Next steps for research
• National PTSD Brain Bank is recruiting
Intimate Partner Violence (IPV) Defined

Physical violence, sexual violence, stalking or psychological aggression from a past or current intimate partner (CDC, 2017)

**Physical:**
- Hitting, kicking, choking, throwing things, beaten, pulled hair, shaking, using a gun or weapon, burning, etc.

**Sexual:**
- Threatening or forcing a partner to take part in a sex act when he or she does not consent, coercion, etc.

**Psychological:**
- Threats, name calling, intimidation, humiliation, economic and social control, isolation, etc.

**Stalking:**
- Repeated following, harassing, or unwanted contact resulting in fear for self or others

- Any sexual IPV, physical IPV, and/or stalking: 36.40%
- Sexual IPV: 18.30%
- Stalking: 10.40%
- Physical IPV: 30.60%
  - Subtypes of physical violence:
    - Severe physical IPV: 21.40%
    - Slapped, pushed, shoved: 29.10%
Head Injuries and Traumatic Brain Injury (TBI): Making the Connection with IPV

- TBI is a serious and underdiagnosed consequence of IPV
  - Blow or jolt to the head that disrupts physiological functioning of the brain
- At least 30% of women who experience IPV report some form of severe physical assault\(^1\)
- Head, neck and face are the most common places for IPV-related injuries
- Estimates from the literature
  - 35% - 92% of women in shelters have experienced \(\geq 1\) head injury during violent attack(s)\(^2\)
  - Multiple head injuries from IPV are common\(^3\)
- Little is known about IPV-related TBI among women Veterans

\(^1\)Thompson, Bonomi, Anderson et al., 2006
\(^2\)Ivany & Schminkey, 2016
\(^3\)Valera & Berenbaum, 2003
Overview of Women Veterans

- Women Veterans are the fastest-growing population of Veterans in the Veterans Health Administration (VHA).
  - Women in VHA care nearly tripled from 159,000 in 2000 to 439,000 in 2015.
- In 2017, over 700,000 women Veterans are enrolled in VHA care.
  - Meeting their health needs is a high priority for VHA.
- Approximately 10% of women Iraq and Afghanistan war (OEF/OIF/OND) Veterans using VHA screen positive for deployment-related TBI vs. 20% of male counterparts.\(^1\)
- Carry a greater health burden than non-veteran women (e.g., multiple medical complications, posttraumatic stress disorder [PTSD], depression), and use more primary and mental health care than male counterparts.\(^2\)

1 Hendricks et al., 2013
2 Frayne et al., 2014

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IPV Experience among Women Veterans

Lifetime IPV among Women Veterans Compared to Non-Veteran Women

<table>
<thead>
<tr>
<th></th>
<th>Veterans</th>
<th>Non-Veterans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifetime IPV</td>
<td>33.0%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>

Dichter et al. Women’s Health Issues. 2011

Past-Year IPV by Age Group Among VHA Primary Care Patients

<table>
<thead>
<tr>
<th>Years of Age</th>
<th>Percentage Reporting Any IPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30</td>
<td>25.5%</td>
</tr>
<tr>
<td>31-44</td>
<td>22.6%</td>
</tr>
<tr>
<td>45-54</td>
<td>22.2%</td>
</tr>
<tr>
<td>55-64</td>
<td>15.8%</td>
</tr>
<tr>
<td>65+</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

Kimerling et al. JGIM, 2016
Study 1: Regional Mail Survey

Study Aims
1. To identify the occurrence of self-reported IPV-related TBI in a sample of female VA patients
2. To examine the associations of IPV-related TBI with mental health symptoms and VA healthcare use

Design
• Mail survey of female VA patients in New England who had participated in a larger study and had agreed to be re-contacted
  • 80% response rate
• Multiple mailing strategy between February and April 2013
  • Up to 3 contacts; $10 incentive

Q 1) IPV-related head event(s):

1) Hit in the head with an object, hand, or fist
2) Pushed/shoved head into a wall, car, furniture or object
3) Broken teeth/jaw
4) Eye/ear injuries
5) Being strangled/choked
6) Other injury to head, neck or face

Q 2) Head event associated with:

1) Loss of consciousness
2) Altered consciousness (i.e., dazed or confused)
3) Posttraumatic amnesia, (i.e., not remembering the events before or after the injury)
4) Concussion
5) Head injury
Measures: Mental Health and Healthcare Use

Mental Health Symptoms

- **PTSD Checklist** (PCL; Weathers et al., 1993) to assess *DSM-IV PTSD* symptom severity

- **Center for Epidemiologic Studies Depression Scale** (CES-D; Radloff, 1977) to assess depression symptoms

Past-year VA healthcare Use

- **Medical visits**: 1) routine outpatient care, 2) ER visits for medical problem, and 3) inpatient care

- **Mental health visits**: 1) outpatient mental health care, 2) ER visits for mental health problem, and 3) inpatient care
Sample 1 Characteristics

Sociodemographics
- N = 176 female Veterans
- Average age = 53.0, SD = 14.1
- 87.5% White
- Years of military service:
  - ≤ 4 = 54.3%; 5-10 = 24.4%, and ≥ 10 = 21.3%
- Military branch:
  - Army = 51.7%; Navy = 18.4%; Air Force/Marines/Coast Guard = 29.9%
- 25% had been deployed in service of OEF/OIF/OND

IPV-Related TBI status
- 19% (n = 33) met criteria for IPV-related TBI history
- 14% (n = 24) reported an IPV-related head event without TBI
IPV-related Head Events

<table>
<thead>
<tr>
<th>IPV-Related Head Event</th>
<th>TBI (n = 33)</th>
<th>IPV-Related Head Event with No TBI (n = 27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hit in Head</td>
<td>69.7%</td>
<td>66.9%</td>
</tr>
<tr>
<td>Pushed or Shoved</td>
<td>63.6%</td>
<td>45.8%</td>
</tr>
<tr>
<td>Broken Teeth</td>
<td>12.1%</td>
<td>0%</td>
</tr>
<tr>
<td>Eye or Ear Injuries</td>
<td>39.4%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Strangled</td>
<td>63.6%</td>
<td>25%</td>
</tr>
<tr>
<td>Other Head Injury</td>
<td>51.5%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

*p < .05
IPV-related TBI is Associated with More Severe PTSD and Depression Symptoms

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*\( p < .0001 \)
Correlates of IPV-related TBI

• IPV-related TBI was associated with higher VA healthcare utilization:
  • Greater volume of past-year VA healthcare use
  • More ER visits for medical and mental health problems
  • More outpatient and inpatient mental health visits

• Women who experienced IPV-related TBI reported significantly more IPV:
  • More past-year physical IPV
  • More past-year sexual IPV
Study 2: National Web-Based Survey

Study Aims

1. To identify the occurrence of IPV-related head events and IPV-related TBI history with and without current symptoms in a national sample of women Veterans who experienced lifetime IPV

2. Examine the associations among IPV-related TBI with IPV-related PTSD diagnosis and DSM-5 PTSD symptom domains (criterion B-E)

Design

• A web-based survey was administered in 2014 to a national sample of 411 U.S. women veterans (75% participation rate); $10 incentive

• 55% (N=224) of women reported lifetime IPV and comprised the current sample

Measures: Modified VA TBI Screening Tool and Current Symptoms

**IPV-related head event(s):**
1) Hit in the head with an object, hand, or fist
2) Pushed/shoved head into a wall, car, furniture or object
3) Broken teeth/jaw
4) Eye/ear injuries
5) Being strangled/choked
6) Other injury to head, neck or face

**Head event associated with:**
1) Loss of consciousness
2) Altered consciousness (i.e., dazed or confused)
3) Posttraumatic amnesia, (i.e., not remembering the events before or after the injury)
4) Concussion
5) Head injury

**Current TBI Symptoms**
One or more of the following symptoms began or got worse following the IPV-related head event and occurred within the past week:
- Memory problems or lapses
- Balance problems or dizziness
- Sensitivity to bright light
- Irritability
- Headaches
- Sleep problems

**PTSD from IPV and PTSD Symptom Criteria**

*PTSD Checklist* (PCL-5; Weathers et al., 2013) to assess probable *DSM-5* PTSD status and cutoffs for *DSM-5* symptom criteria:
- Criteria B: Intrusion
- Criteria C: Avoidance
- Criteria D: Cognition/Mood
- Criteria E: Arousal
Sample 2 Characteristics

Sociodemographics
- N = 224 female Veterans
- Average age = 49.12, SD = 13.5
- 62.9% Non-White
- Years of military service:
  - ≥ 5 years = 40%
- Military branch:
  - Army = 43.8%; Navy = 21.9%; Air Force/Marines/Coast Guard = 33.0%
- 19% had been deployed in service of OEF/OIF/OND

IPV-related TBI and PTSD
- 28.1% (n = 63) of the 224 women in this sample screened positive for IPV-related TBI history
- 12.5% (n = 28) of the 224 women screened positive for IPV-related TBI with current symptoms
- 24.6% (n = 55) of the 224 met criteria for probable PTSD
Women with DSM-5 IPV-related TBI with current TBI symptoms:

• Were 5.9 times more likely to have probable IPV-related PTSD than women with no IPV-related TBI
• Were significantly more likely than women without current TBI symptoms and women without IPV-related TBI to meet criteria for:
  • PTSD Criterion B (Intrusion) – 78.6% vs. 37.1% and 29.2%
  • PTSD Criterion C (Avoidance) – 82.1% vs. 40% and 29.8%
  • PTSD Criterion D (Cognition/Mood) – 85.7% vs. 31.4% and 32.9%
  • PTSD Criterion E (Arousal) – 89.3% vs. 34.3% and 28%
    • Cramer’s V for all 4 clusters = .34 - .42
VHA has Many Opportunities to Address IPV and TBI

- Integrated healthcare system with accessible EMR
  - Routine screening of women VA patients in primary care, EDs, mental health etc.
- IPVAP Coordinators to assist with local programming
  - Assessment, safety planning, building referral networks with community resources
  - Cross training with TBI clinics and other services (e.g., mental health)
- Available referral to Polytrauma Clinics
  - Comprehensive TBI Evaluations → Treatment recommendations and referrals
- Increasing training for VHA providers on IPV and its correlates
- Wrap-around mental health services and social support services
  - Evidence-based assessments and interventions for PTSD, depression etc.
  - Programs to address homelessness, supported employment, etc.
- Women’s health, TBI, and behavioral health are priority areas within VHA research
  - Women’s Health Research Network and Practice-Based Research Networks (Frayne)
VA Outreach and Awareness Efforts

Pledge to screen and intervene

#StopIPV
I make a difference by screening for intimate partner violence.
Ask your VA Provider for help.

Traumatic Brain Injuries can happen at home
Intimate Partner Violence
VA can help #StopIPV

National Domestic Violence Hotline 1-800-799-SAFE

Strangulation is one of the most lethal forms of Intimate Partner Violence
VA can help #StopIPV

National Domestic Violence Hotline 1-800-799-SAFE
VA and DoD Developed Apps

“Concussion Coach” App
polytrauma.va.gov/ConcussionCoach.asp

“PTSD Coach” App
ptsd.va.gov/public/materials/apps/PTSDCoach.asp
Future Directions

• Need to understand the ways in which IPV-related TBI may compound the effects of other stressors, including deployment-related TBI
  – Retraumatization $\leftrightarrow$ TBIs
• TBI stemming from sexual assaults that occurs during military service (military sexual trauma)
• Unknown comorbidity of IPV-related TBI and deployment-related TBI
• Correspondence between IPV-related TBI screening tools and comprehensive TBI evaluations
  – Modified VA TBI screening tool holds promise
• Women’s experiences and perceptions of such care
  – Effectiveness, Acceptability, Safety
Take Home Messages

• Women Veterans are a sub-population at high risk for IPV-related TBI
  • Nearly 1 in 5 among general sample of women Veteran VHA patients
  • Nearly 1 in 3 women Veteran IPV survivors
• PTSD symptom profiles are somewhat different for women Veterans with IPV-related TBI with current TBI symptoms
  • Researchers and clinicians should use caution when attributing overlapping symptoms to PTSD and consider TBI comorbidity when addressing IPV
• IPV-related TBI is robustly associated with mental health needs
• IPV-related TBI among women Veterans is associated with high volumes VHA healthcare use, especially ER and mental health visits
• Integrated healthcare systems, especially VHA, are well-poised to address and study IPV-related TBI
Clinical Considerations

- Contact your local IPVAP Coordinator to learn more about IPV screening and intervention options at your sites
  - National Program Manager: Dr. LeAnn Bruce (LeAnn.Bruce@va.gov)
- Build off of VA’s efforts to routinely screen women for past-year IPV
  - Screen women who have experienced IPV for TBI (past-year and lifetime)
  - Modified VA TBI Screening Tool
  - Alternatively, ask about whether she’ experienced violence/blow to the head that resulted in loss of consciousness or alterations in consciousness, etc.
- Provide referrals for neuropsychological evaluation
- Safety planning
  - Talk about ways to protect her head
- Treat mental health symptoms stemming from IPV
- Increase education and outreach across clinics and disciplines
- Destigmatization of IPV and its health effects
The Influence of Head Injury on Recovery from PTSD
Cognitive Processing Therapy: An Evidence-based Treatment for PTSD

- Evidence-based intervention for PTSD
- Cognitive theoretical perspective
- Can be conducted within group or individual format
- Typically about 12 sessions conducted on a weekly basis with many opportunities for continued work outside the session.
Cincinnati VA
Comorbid TBI/PTSD

- Only study to date looking at outcomes across severity of TBI with CPT
- OEF/OIF Veterans in residential care
- CPT plus cognitive rehab
- Significantly greater improvements in the Veterans with moderate to severe TBI.

Chard et al., 2011
• Between 2001-2014, three clinical trials were conducted to assess the efficacy of Cognitive Processing Therapy (CPT) on civilian survivors of interpersonal violence.1

• We combed back through data to assess:
  – The extent of trauma reported by these survivors
  – The extent of injury reported during these assaults
  – The number and type of head injuries
  – The influence of those head injuries on the course of recovery

1Resick, Galovski, et al., 2008; Galovski et al., 2012; Galovski et al., 2016
Study Sample

- 496 adult participants were screened for PTSD secondary to interpersonal violence
  - 37 years of age
  - 15.25 years since their index event
  - 13.25 years of education
  - 84% female
  - Race: 42% African-American, 49% White, 9% other
  - 49% single, 19% married/cohabitating, 25% divorced/separated
  - Annual Income:
    - $5k - $20K: 34%
    - <$5,000: 25%
Measures

- Clinician Administered PTSD Scale – DSM-IV
- Beck Depression Inventory II
- Lifetime Trauma Survey
- Trauma Interview
  - Identified Index Trauma
  - Assessed injury during index event
  - Assessed injuries which occurred during other lifetime assaults
QUESTION 1

What is the extent of trauma exposure in this sample?
## Exposure to Traumatic Events: The Index Trauma

<table>
<thead>
<tr>
<th>Identified Index Trauma</th>
<th>N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood Sexual Assault</td>
<td>195 (40%)</td>
</tr>
<tr>
<td>Childhood Physical Abuse</td>
<td>45 (9.2%)</td>
</tr>
<tr>
<td>Adult Sexual Assault</td>
<td>120 (24.6%)</td>
</tr>
<tr>
<td>Adult Physical Assault</td>
<td>124 (25.5%)</td>
</tr>
</tbody>
</table>
In addition to the index trauma...

<table>
<thead>
<tr>
<th>Additional Trauma Exposures</th>
<th>N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood sexual trauma (contact)</td>
<td>349 (73%)</td>
</tr>
<tr>
<td>Chronic CSA (range: 12 -100s)</td>
<td>302 (64.3%)</td>
</tr>
<tr>
<td>Childhood Physical Trauma</td>
<td>301 (64%)</td>
</tr>
<tr>
<td>Adult Sexual Trauma</td>
<td>307 (47.6%)</td>
</tr>
<tr>
<td>Adult Physical Assault</td>
<td>361 (56%)</td>
</tr>
<tr>
<td>Intimate Partner Violence</td>
<td>287 (58.7%)</td>
</tr>
</tbody>
</table>
QUESTION 2 & 3

What is the extent of injury reported during attacks?

How many of the injuries are consistent with “significant head injury”?
## Non-Head Injuries

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Index Trauma</th>
<th>Injuries from other assaults 1 - 3 times</th>
<th>Injuries from other assaults 4 - 50+ times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruises on body</td>
<td>42.6%</td>
<td>16.7%</td>
<td>43.9%</td>
</tr>
<tr>
<td>Broken bones</td>
<td>5.8%</td>
<td>13.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Cuts</td>
<td>24.1%</td>
<td>16%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Burns</td>
<td>4.6%</td>
<td>8.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>2%</td>
<td>9.7%</td>
<td>2%</td>
</tr>
<tr>
<td>STDs</td>
<td>3.6%</td>
<td>14.1%</td>
<td>1%</td>
</tr>
<tr>
<td>Damage to internal organs</td>
<td>9.4%</td>
<td>5.6%</td>
<td>4%</td>
</tr>
</tbody>
</table>

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# Head Injuries

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Index Trauma</th>
<th>Injuries from other assaults 1 - 3 times</th>
<th>Injuries from other assaults 4 - 50+ times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruises: head, face, neck</td>
<td>34.7%</td>
<td>24.5%</td>
<td>32.7%</td>
</tr>
<tr>
<td>Broken bones: head, neck, face</td>
<td>3.8%</td>
<td>10.7%</td>
<td>2%</td>
</tr>
<tr>
<td>Cuts: head, neck, face</td>
<td>18.1%</td>
<td>15.7%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Lost consciousness</td>
<td>18.3%</td>
<td>20.8%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Damaged teeth</td>
<td>4.8%</td>
<td>10.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Ruptured eardrum</td>
<td>2%</td>
<td>5%</td>
<td>0%</td>
</tr>
</tbody>
</table>
In summary…

- Participants across 3 clinical trials reported quite complex interpersonal trauma histories.
- The extent of the injuries (including head injuries) both during the index trauma and throughout their trauma histories was substantial and repetitive.
- Adding to the traumatic stress burden reported by our participants, the majority also described socioeconomic disadvantage:
  - lower levels of education
  - lack of employment
  - over half lived below the poverty line.
QUESTION 4

Does the experience of head injury influence recovery from PTSD & depression over a course of CPT?
In order to assess the influence of HI on treatment outcome, we grouped the sample into 3 comparison conditions:

- **Head Injury (N = 224)**
  - Bruises, broken or dislocated bones in head, neck, face; knocked unconscious, broken teeth, ruptured eardrums

- **Non-head injury (N = 38)**
  - Bruises, broken or dislocated bones in areas other than head, neck, face; ruptured internal organs, STDs, burnings, knifings, poisoning, gunshots, miscarriages

- **No Injury (N = 42)**
Change in PTSD: (CAPS)
“Are you experiencing ongoing medical complications from your injury?”

- We were able to identify 21 individuals who described ongoing medical problems/symptoms consistent with head injury. In their words...
  - “continued pain, chronic jaw dislocation, hearing loss”
  - “headaches & vision difficulties b/c being hit repeatedly in head”
  - “headaches, hearing problems, eyesight left eye, dizziness, memory problem”
  - “memory loss, incontinence, extremity numbness, had to learn to talk & walk & use hands again.”
  - “thinking-head injuries, with teeth dentures, partials, left eye permanently damaged, torn ligament”
Compared to a group who denied head injuries...

• BUT, reported other ongoing medical problems/symptoms reported:
  – “blood clots in lungs”
  – Multiple participants: “Pregnancies from assault, inability to conceive”
  – “hip pops out of joint, lower back pain; lost ability to carry child full term”
  – “nerve damage in left leg, right leg, right arm, removed part of pancreas and spleen, (pain in stitches)”
  – “gastrointestinal sensitivity for whole life, inability to conceive”
  – “permanent liver damage due to poisoning” -4 yrs escaped
  – “burns got infected- can’t sit or lay down”
  – “stomach pain/HPV/cervical cancer/ulcers/gallbladder removed”
### Ongoing medical problems consistent with head injury vs no HI

<table>
<thead>
<tr>
<th></th>
<th>Ongoing HI sxs (n = 21)</th>
<th>No HI (n = 84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time since index trauma</td>
<td>X = 8.8 years</td>
<td>X = 15.8</td>
</tr>
<tr>
<td>Gender</td>
<td>0 males</td>
<td>Includes 7 males</td>
</tr>
<tr>
<td>Dropped out of treatment</td>
<td>42%</td>
<td>30%</td>
</tr>
<tr>
<td>Index trauma</td>
<td>52% APA*</td>
<td>13% APA</td>
</tr>
<tr>
<td></td>
<td>5% CSA*</td>
<td>51% CSA</td>
</tr>
<tr>
<td></td>
<td>10% CPA</td>
<td>1% CPA</td>
</tr>
<tr>
<td></td>
<td>33% ASA</td>
<td>35% ASA</td>
</tr>
<tr>
<td>CSA</td>
<td>62%</td>
<td>73%</td>
</tr>
<tr>
<td>CPA</td>
<td>57%</td>
<td>41%</td>
</tr>
<tr>
<td>ASA</td>
<td>62%</td>
<td>61%</td>
</tr>
<tr>
<td>APA*</td>
<td>86%</td>
<td>54%</td>
</tr>
<tr>
<td>IPV*</td>
<td>64%</td>
<td>35%</td>
</tr>
</tbody>
</table>
PTSD severity across assessment intervals (CAPS)
Individual symptoms of PTSD at Post-tx

* = p<.05; ** = P < .01. Trends for psychological distress and foreshortened future

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Depression severity across assessment intervals (BDI-II)
Individual depression symptoms at post-tx

- Anhedonia ($p = .022$) and Pessimism ($p = .052$) remained higher in the ongoing head injury group.

- Trends emerged indicating higher residual symptom severity following a course of treatment for:
  - Loss of pleasure ($p = .077$)
  - Suicidality ($p = .097$)
  - Changes in appetite ($p = .066$)
Refractory PTSD

![Graph showing post treatment and follow-up results for those with and without head injury symptoms.](image-url)
The good news...

- Our head injured individuals showed significant improvements in PTSD and depression at rates of change similar to their non-head injured and non-injured counterparts.
- Therapy did not appear to be less palatable to the head injured participants, even those suffering from medical problems associated with the HI. There were no differences in completion rates.
- **However**, our head-injured participants are reporting more severe symptoms at baseline and are significantly more likely to remain above clinical cutoffs for PTSD after a course of treatment.
- The differences in outcomes may be due to several specific symptoms of PTSD. The question remains: are these symptoms better attributable to head injury than to PTSD and depression?
The Challenge: To which condition do we attribute the residual symptoms?

**PTSD**
- Intrusive Thoughts
- Nightmares
- Flashbacks
- Distress
- Physio
- Avoidance
- Foreshortened Future
- Numbing
- Detachment
- Amnesia
- Startle
- Cognition
- Anger
- Mood
- Concentration
- Insomnia
- Hypervigilance

**DEPRESSION**
- Mood
- Anger
- Insomnia
- Concentration
- Suicidality
- Appetite
- Energy
- Worthless
- Anhedonia
- Psychomotor Agitation

**TBI**
More questions than answers…

- To what extent does brain injury influence recovery from PTSD?
- What elements of the assault might be particularly important in prognosis?
  - Force of blow? Location of blow? Time spent unconscious? Time since assault?
- Chronicity of exposure – multiple blows, developmental age during assaults? Time between injuries? Sex differences?
- How might we improve our ability to detect the effects of brain injury?
- Will this knowledge lead us to more holistic interventions banking on multi-disciplinary strategies?
Moving Forward: Improving our Understanding of the Sequelae of Head Injury in Women who Suffer through Interpersonal Assaults
Characterizing head injury sustained during IPV

- WHSD/NCPTSD is launching a study to assess the influence of TBI in women survivors of IPV who suffer from PTSD.

- Partners:
  - Translational Research Center for TBI and Stress Disorders at the Veteran’s Administration in Boston Healthcare System (TRACTS)
  - Missouri Institute of Mental Health (MIMH)
  - Washington University

- Primary Aim: **Understand the interactive mechanisms that underlie this comorbidity in order to develop multimodal, personalized treatments that will be more effective than current, single modal strategies.**
TBI and IPV assessment battery

Psychological

Neuropsychological

Medical and Physiological
VA’s National PTSD Brain Bank
VA National PTSD Brain Bank

• Aim: Promote understanding of the impact of stress, trauma and PTSD on brain tissue, neurocircuitry, and gene expression. The brain bank will:
  – acquire & prepare brain tissue, establish psychiatric diagnosis, promote research through intramural and extramural programs

• Budget: First year $1.8 million, Recurring $1.5 million

• At Boston, programmatically linked with the VA’s Alzheimer's, ALS, TBI & CTE Brain Banks

• Will receive comparison tissue (normal & psychiatric controls) from all receiving sites

• Only VA Brain Bank that is authorized to accept tissue from non-Veterans
VA National PTSD Brain Bank

- Secondary Acquisition Sites (primarily through collaboration with Medical Examiner Offices) & Additional Research:
- Research is also going on at Boston, Duke, Central Texas VA/Texas A&M & Harvard. West Haven leads the intramural research core.
- There are 5 NIMH NeuroBioBanks.
  - We network with all 5
  - Two (Miami & Harvard) are members of our consortium
  - Pittsburgh is actively collaborating with us in research
VA National PTSD Brain Bank: Organizational Chart

Headquarters
White River Junction VA: Friedman

Primary Receiving Site
Boston VA: Kowell, McKee, Stein, Brady, Keane, Kaloupek

Secondary Receiving Sites
Durham VA: Williamson; Miami: Mash; Harvard: Baretta

Primary Assessment Site
USUHS: Ursano, Benedek

Primary Research Site
West Haven VA: Krystal, Duman
# NPBB: Current Inventory of Brain Tissue

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Veteran</th>
<th>Suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Traumatic Stress Disorder</td>
<td>34</td>
<td>22</td>
<td>56</td>
<td>28(17)</td>
<td>10(3)</td>
</tr>
<tr>
<td>Major Depressive Disorder</td>
<td>27</td>
<td>19</td>
<td>46</td>
<td>4(2)</td>
<td>16(4)</td>
</tr>
<tr>
<td>Depression Not Otherwise Specified</td>
<td>10</td>
<td>1</td>
<td>11</td>
<td>4(4)</td>
<td>3(2)</td>
</tr>
<tr>
<td>Schizoaffective Disorder</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1(1)</td>
<td>0</td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2(1)</td>
<td>1(1)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Control</td>
<td>32</td>
<td>15</td>
<td>47</td>
<td>5(3)</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>106</td>
<td>62</td>
<td>168</td>
<td>44(28)</td>
<td>30(10)</td>
</tr>
</tbody>
</table>

This table shows NPBB’s current inventory of brain tissue by diagnosis, gender, veteran status and whether the donor died from suicide. Numbers in parentheses (in the veteran and suicide columns) represent the number of males in each category.
Women encouraged to pledge to donate their brains for a study of the effects of TBI and PTSD

For more information on this effort

- pinkconcussions.com
- research.va.gov/programs/tissue_banking/PTSD/
- Call: 1-800-762-6609

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Director of VA's National PTSD Brain Bank, Senior Advisor, VA's National Center for PTSD & Professor and Vice Chair for Research at the Department of Psychiatry at the Geisel School of Medicine
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Thank you!

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