

John D. Corrigan, PhD
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Traumatic Brain Injury, Mental Health and Addiction



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Financial Disclosure

I have no financial relationships to disclose
relevant to this presentation.

Traumatic Brain Injury (TBI)

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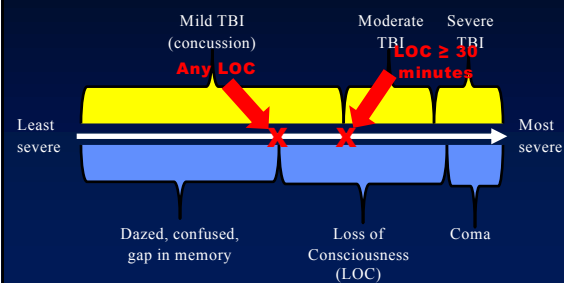
Poll Question*

TBI is...

- A. A life altering injury for survivors and their families, profoundly impacting the patient's functional status.
- B. A very common injury that is essentially inconsequential to the individual's functional status following recovery.
- C. Both A and B and everywhere in between.

*Thanks D. Arciniegas & H. Wortzel for this slide

Continuum of TBI Severity



Not Just Severity of Injury

- Cumulative effects from multiple TBIs
 - number and/or spacing?



TBI due to Blasts—the “signature injury” of combat in Iraq and Afghanistan



- Can blast forces alone cause mild TBI?
- If so, is it the same pathology as TBI caused by mechanical forces?
- What about multiple blasts?

Groups Who May Have Multiple Mild TBI's

- Military personnel, particularly those with combat deployment in OEF/OIF
- Athletes, particularly boxers, football players & hockey players
- Victims of intimate partner violence and childhood physical abuse
- People who misuse and abuse substances
- Other vulnerable populations (e.g., psychiatric disorders, homeless, inmates)

Not Just Severity of Injury

- Cumulative effects from multiple TBIs
 - number and/or spacing?
- Age at injury
 - childhood but also with normal aging
- How recent
- When combined with other neurological conditions

Re-cap

- TBI occurs when an external force causes an alteration in consciousness
- Effects can be temporary or permanent
- Range from mild to severe
- A concussion is a mild TBI
- Mild TBIs may have cumulative effects or interact with normal development

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| Lifetime History of TBI: | Any TBI | TBI with LOC | Mod/Severe TBI |
|--|---------|--------------|----------------|
| Colorado non-institutionalized adults (Whiteneck et al.) | 43% | 24% | 6% |
| Ohio non-institutionalized adults (Corrigan et al.) | unk | 22% | 3% |

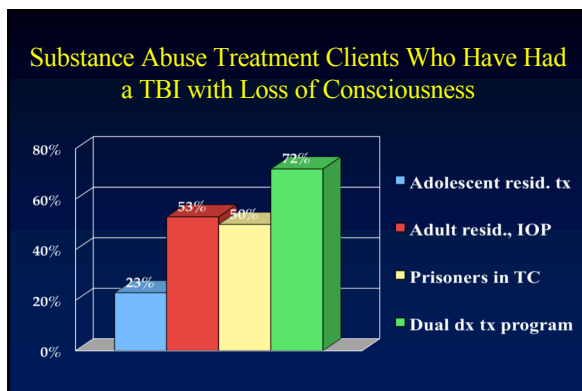
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| Homeless (*Hwang et al.; **Bremner et al., Solliday-McRoy et al.) | 53%* | 47%** | 12%* |

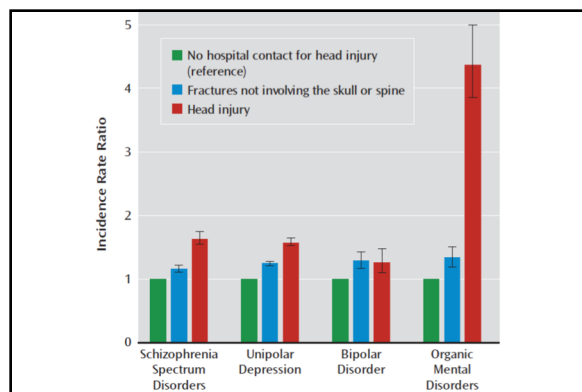
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Danish Population Registry

(Orlovska et al., 2014)

- 1.4 million people born in Denmark from 1977-2000
- Followed until 12/31/2010 (10-33 years)
- 114,000 with a hospital contact for a TBI
- Records matched to the Danish Central Psychiatric Register
- Case excluded if psychiatric diagnosis preceded TBI
- Compared to persons without injury or with orthopedic injuries



Suicide and Prior History of TBI

- Swedish mortality N=2.6 M (Fazel et al., 2014)
 - prior TBI vs same sex & age (AOR=3.3)
 - prior TBI vs uninjured siblings (AOR=2.3)
- Danish suicides N=7.4 M (Madsen et al., 2018)
 - prior TBI vs same sex, age & era (IRR=2.6)
 - prior severe TBI vs same sex, age & era (IRR=3.4)
- U.S. suicides N=270,074 (Ahmedani et al., 2018)
 - prior TBI vs same sex, age, psychiatric dx & SUD (AOR=8.8) [the highest of all co-morbid conditions]

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Contents lists available at ScienceDirect

Addictive Behaviors

ELSEVIER journal homepage: www.elsevier.com/locate/addictbeh

Commentary

The intersection of lifetime history of traumatic brain injury and the opioid epidemic

John D. Corrigan^a, Rachel Sayko Adams^{b,*}

Persons with TBI more likely prescribed opioids

- Headache and orthopedic pain common with TBI
- Persons with persistent post-concussive syndrome more likely prescribed opioids
- 70% of patients receiving rehabilitation for TBI prescribed opioids

Persons with TBI more susceptible to addictive influence of opioids

Persons with TBI have more challenges for successful treatment

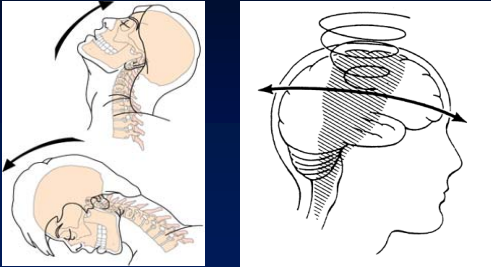
Pathophysiology

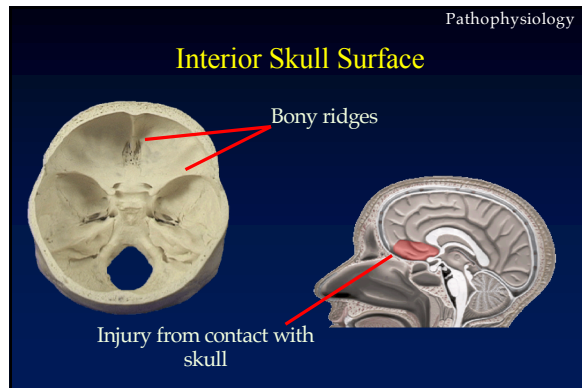
The “Fingerprint” of TBI

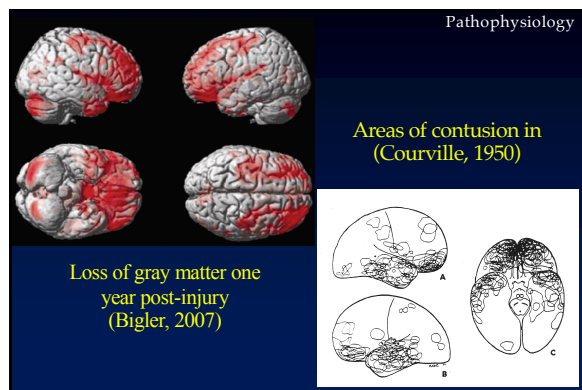
Frontal areas of the brain, including the frontal lobes, are the most likely to be injured as a result of TBI, regardless the point of impact to the head

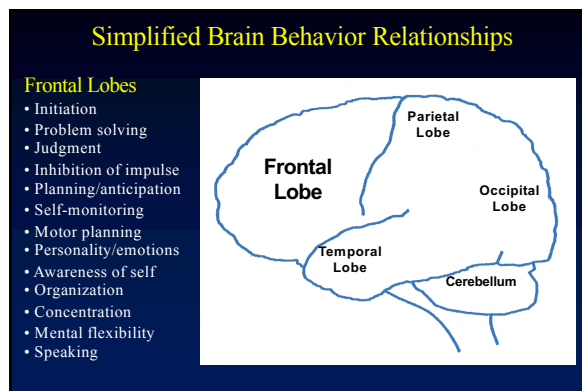
Pathophysiology

The brain is set into motion along multiple axial planes

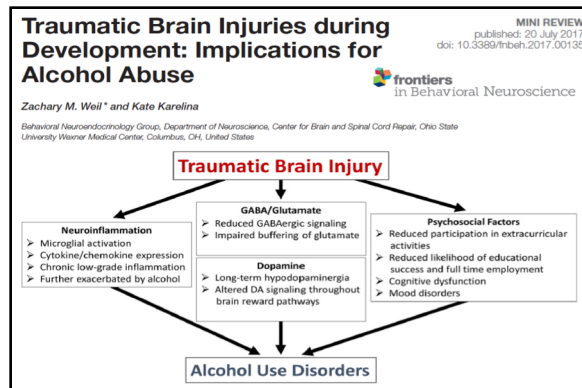


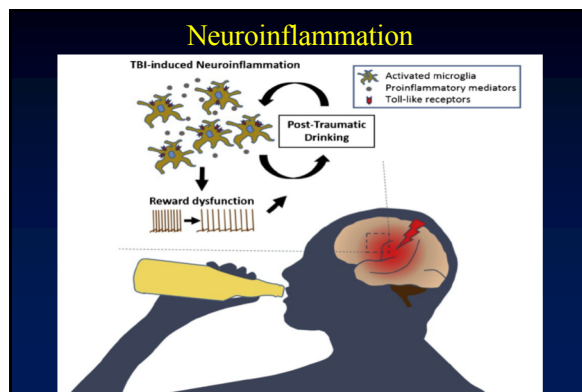


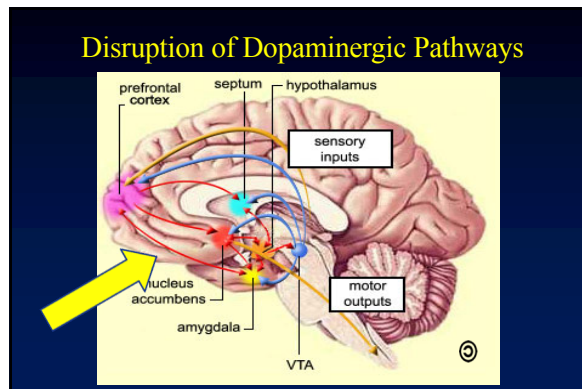




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Whether working in mental health, substance abuse, criminal justice or other systems, it is worthwhile to know whether the person you are working with has had a TBI.

Lessons Learned from TBI and Substance Use Disorders

Two Consistent Clinical Observations:

- Compared to others in SUD treatment there is an even *greater* disconnect between TBI clients' intentions and their behavior.
- Clients with TBI are more likely to prematurely discontinue treatment, often after being characterized as non-compliant.

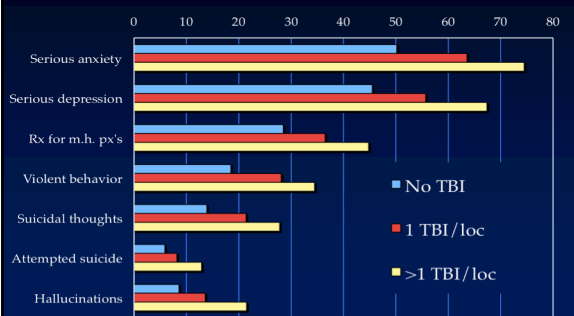
Reasons for negative effect on outcome due to TBI:

1. Neurobehavioral consequences undermine ability to participate “conventionally” in treatment
 - Cognitive load in treatment
 - Misattribution of behavior by peers & professionals

Reasons for negative effect on outcome due to TBI:

1. Neurobehavioral consequences undermine ability to participate “conventionally” in treatment
2. Greater co-occurring psychiatric disorders for those with TBI

Symptoms past 12 months of Clients Admitted for Substance Abuse Treatment in Kentucky (N=7,932)



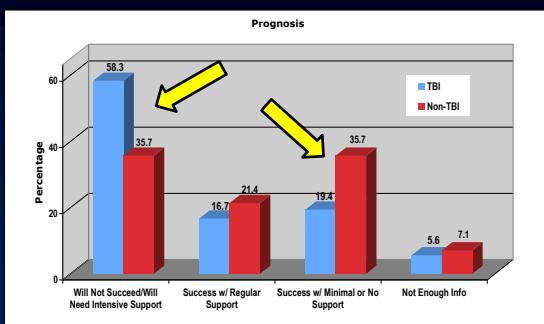
Dually diagnosed SUD and Severe Mental Illness [N=295] (McHugo et al., 2016)

- 80% at least 1 TBI; 61% at least 1 TBI with LOC; 24% at least 1 mod/sev TBI
- Extent of TBI history associated with worse alcohol use, **worse psychiatric symptomology**, more arrests, greater homelessness
- TBI history associated with greater likelihood of **PTSD** and **anti-social and borderline personality disorders**.
- Earlier age at 1st TBI with LOC associated with presence of psychotic spectrum disorders

Reasons for negative effect on outcome due to TBI:

1. Neurobehavioral consequences undermine ability to participate “conventionally” in treatment
2. Greater co-occurring psychiatric disorders for those with TBI
3. Less ability to sustain improvements without external structure

Staff Prognosis for Continued Success after IDDT



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Recommendations for SUD Treatment Providers

Treatment planning needs to incorporate:

- Routine screening for lifetime history of TBI
- Accommodations for neurobehavioral deficits
- Co-morbid interactions (e.g., depression, anxiety, violence prone, pain, sleep disturbance)
- Greater formal and/or informal supports needed during and after treatment completion

~~Behavioral Health~~ Recommendations for SUD Treatment Providers

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THANK YOU

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