

Intimate Partner Violence-Related Acquired Brain Injuries: A Presentation for the California Board of Parole Hearings

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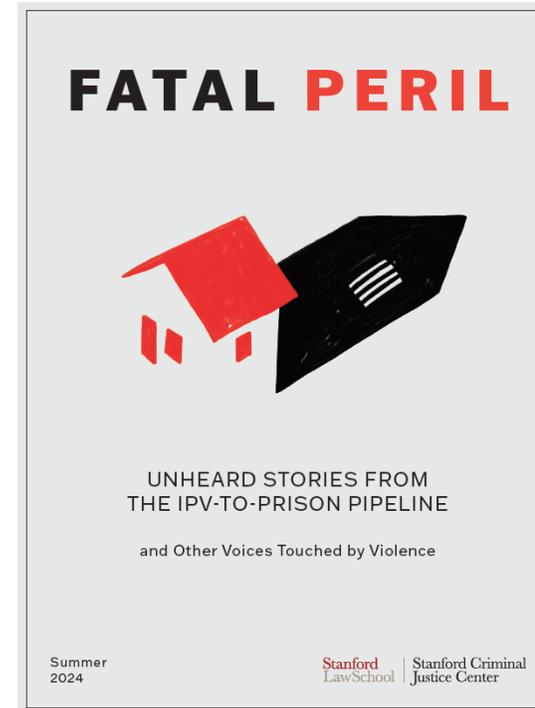
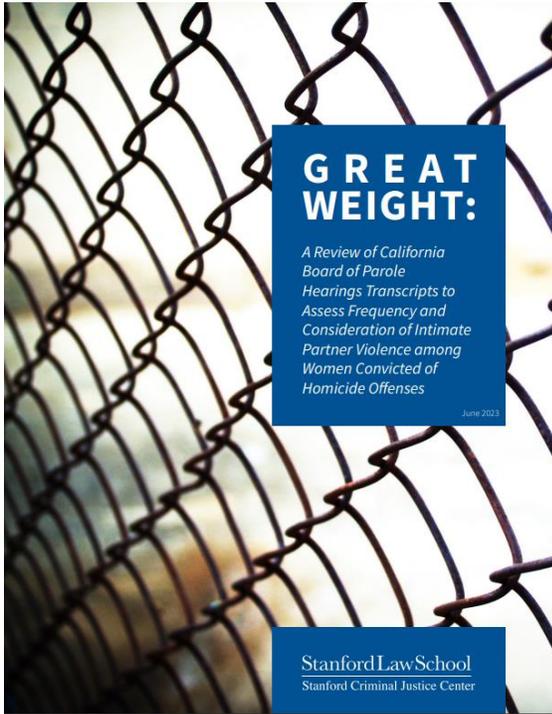
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Baltimore, MD



Disclosures

I have no financial conflicts of interest to disclose.



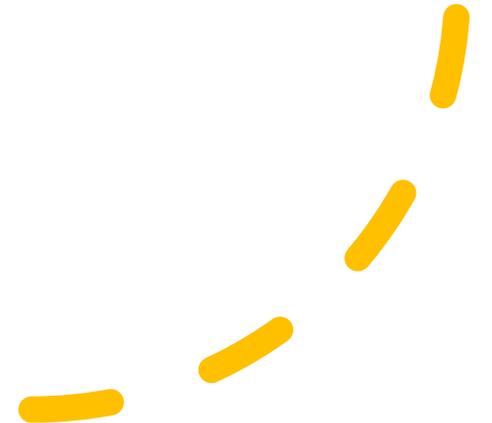
- Enhance IPV Training for BPH Commissioners and Staff
- Incorporate stories/voices of IPV survivors
- Support the criminal legal system in taking IPV, probable TBI (and strangulation) into account

Brain Injuries and The Criminal Legal System

- Symptoms from unrecognized brain injuries may increase various risks
 - Memory problems may result in:
 - Difficulty understanding and remembering rules, directions
 - Challenges performing memory-critical tasks (e.g., during assessments, interrogations, testimony)
 - Suggestibility or confabulation during questioning
 - Negative behaviors may be misinterpreted as deliberate, defiant, leading to sanctions/rules violations
 - TBI-related impaired decision-making, memory issues, substance misuse may lead to challenges identifying unsafe situations and behaviors
 - Executive function deficits affect ability to plan, organize, remember, connect actions with consequences
 - Deficits may impact competency to stand trial
- Brain injury identification, and subsequent supports and services, can lessen these risks

Objectives

- To define brain injury and describe the acute, interim, and long-term effects
- To discuss strategies for interacting with someone with a brain injury
- To describe how intimate partner violence and brain injuries interact

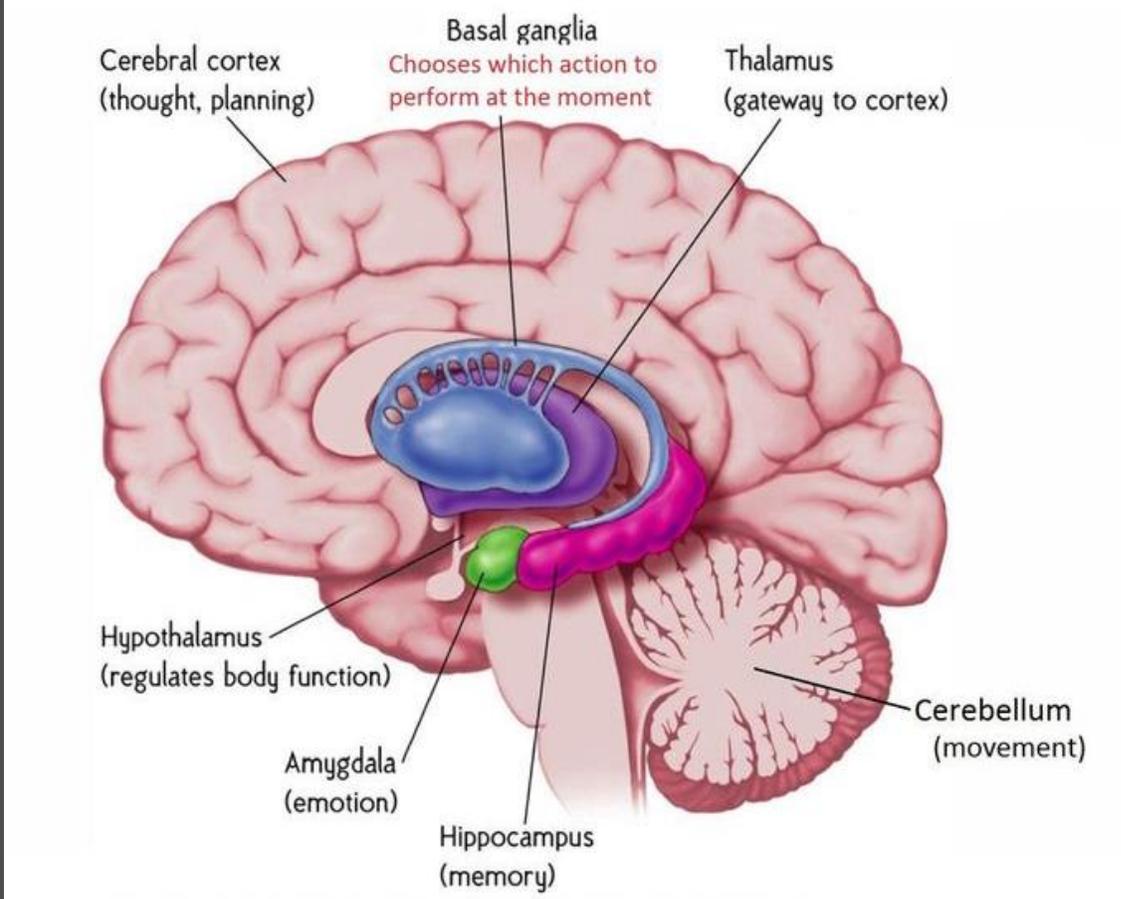
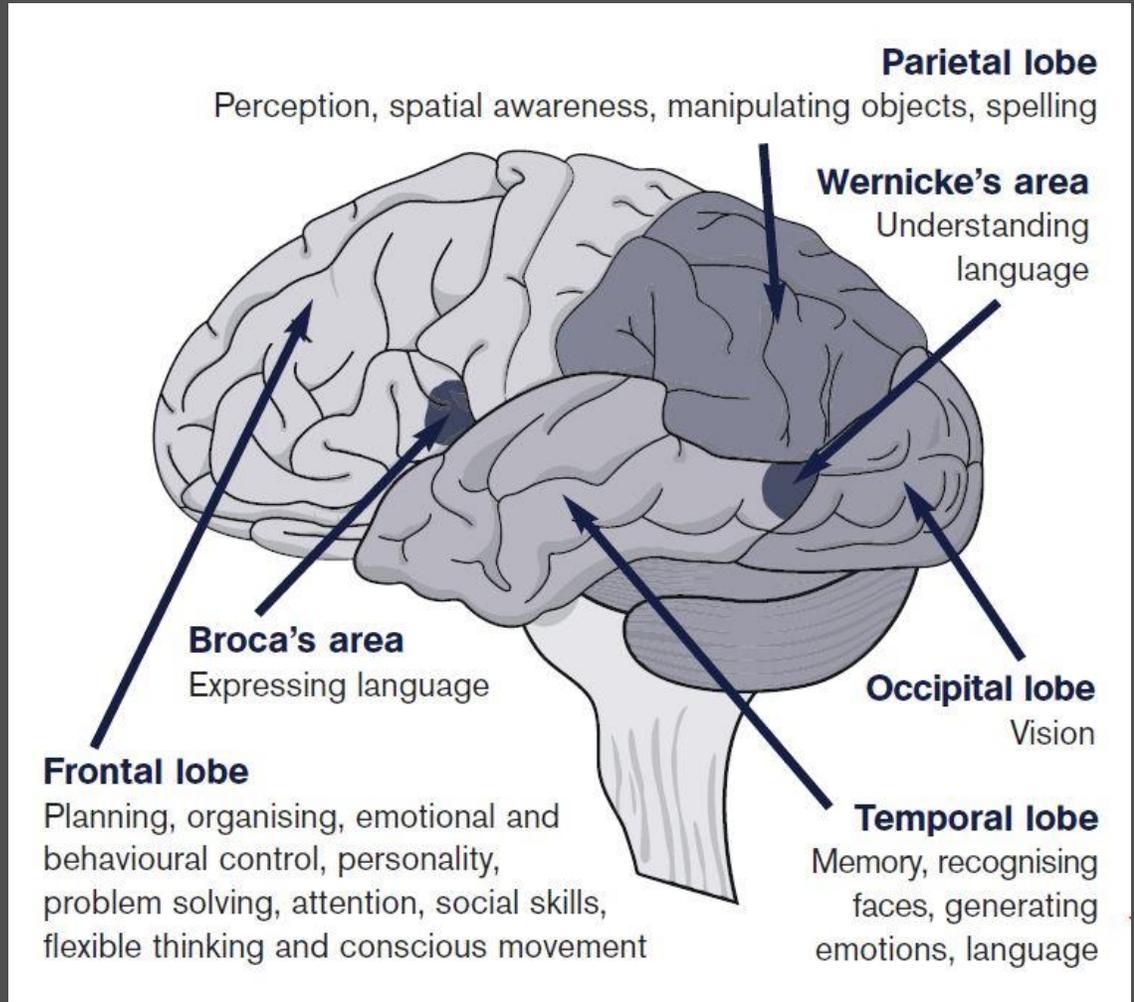


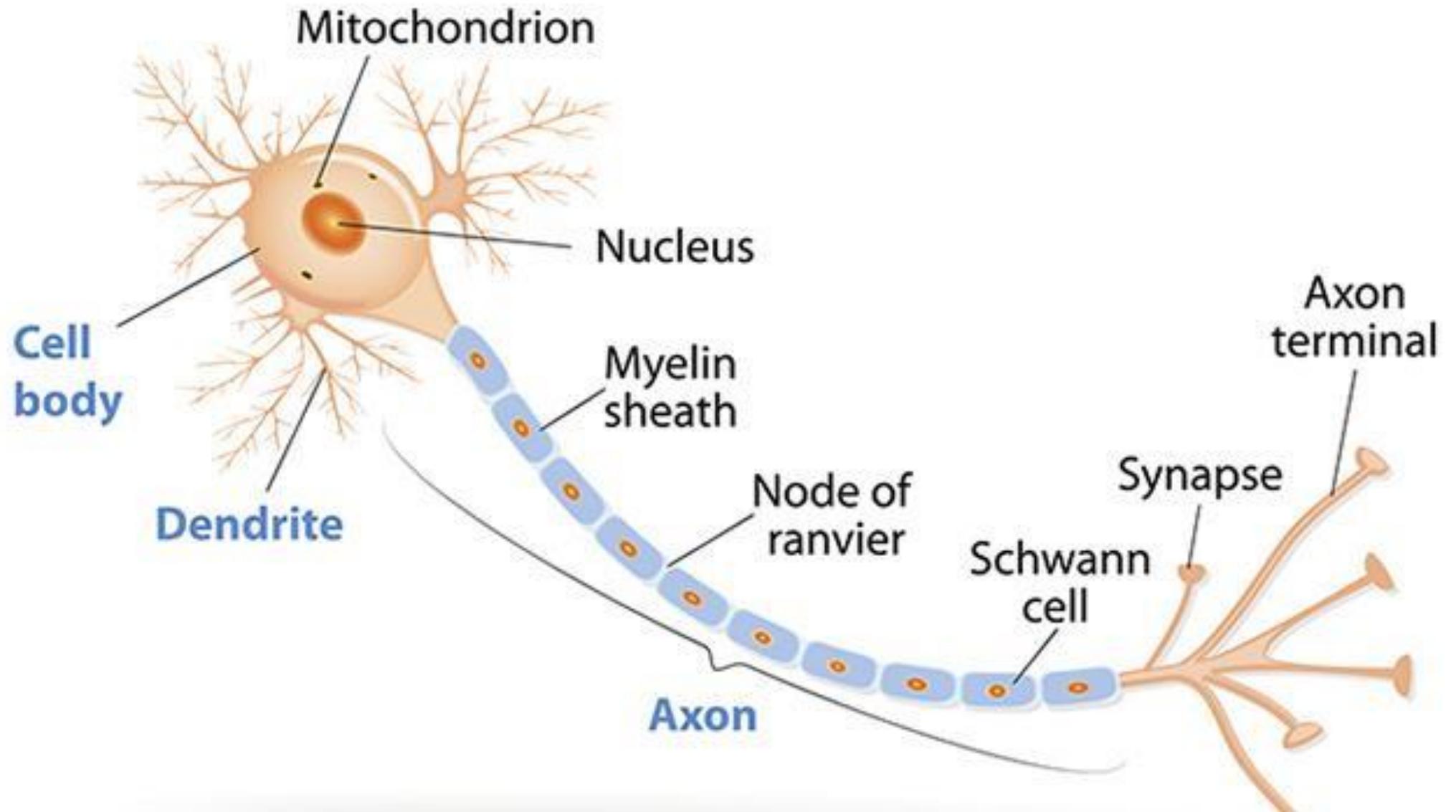
A Brief Overview

Brain and Neck



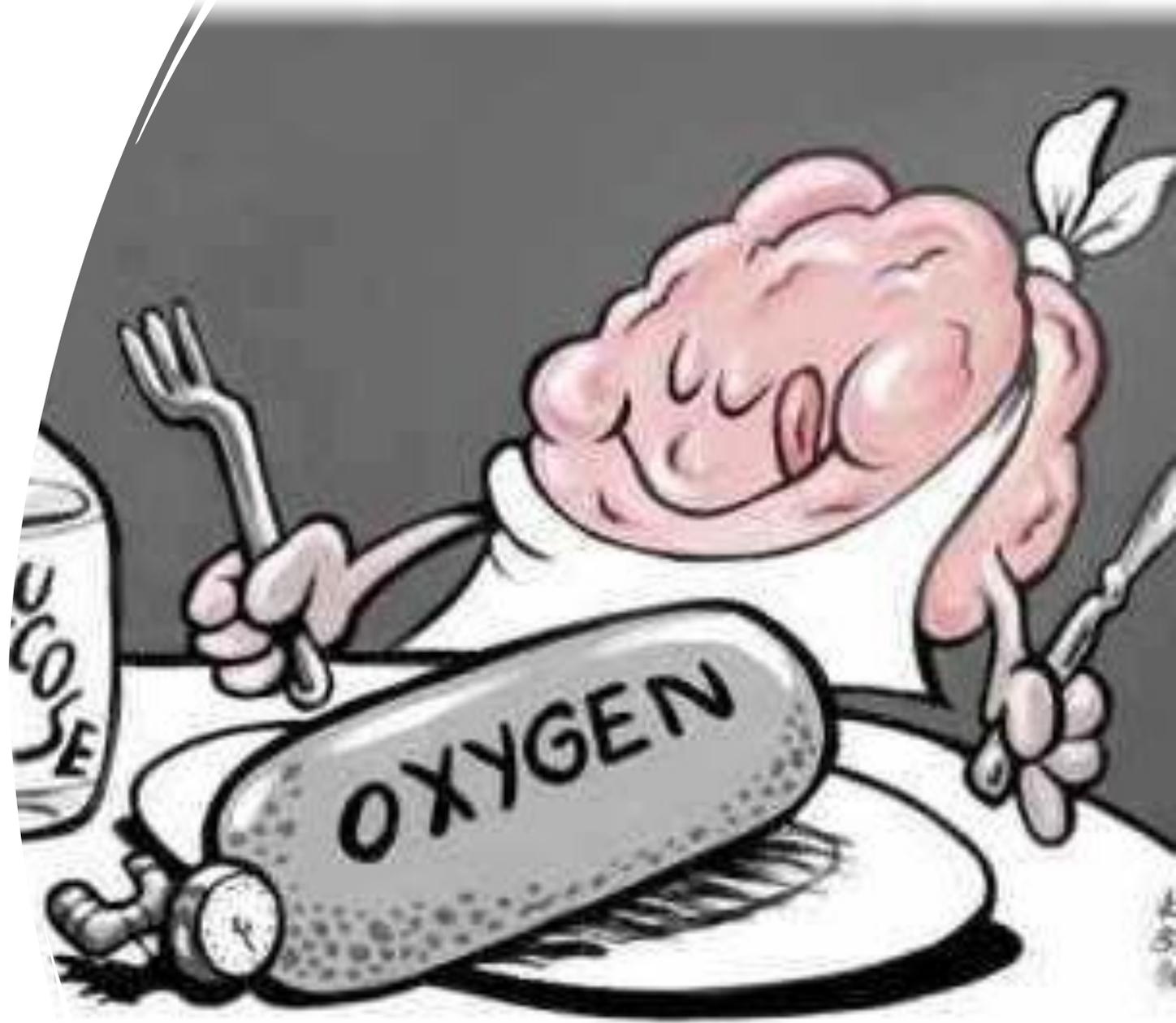
NZ Herald

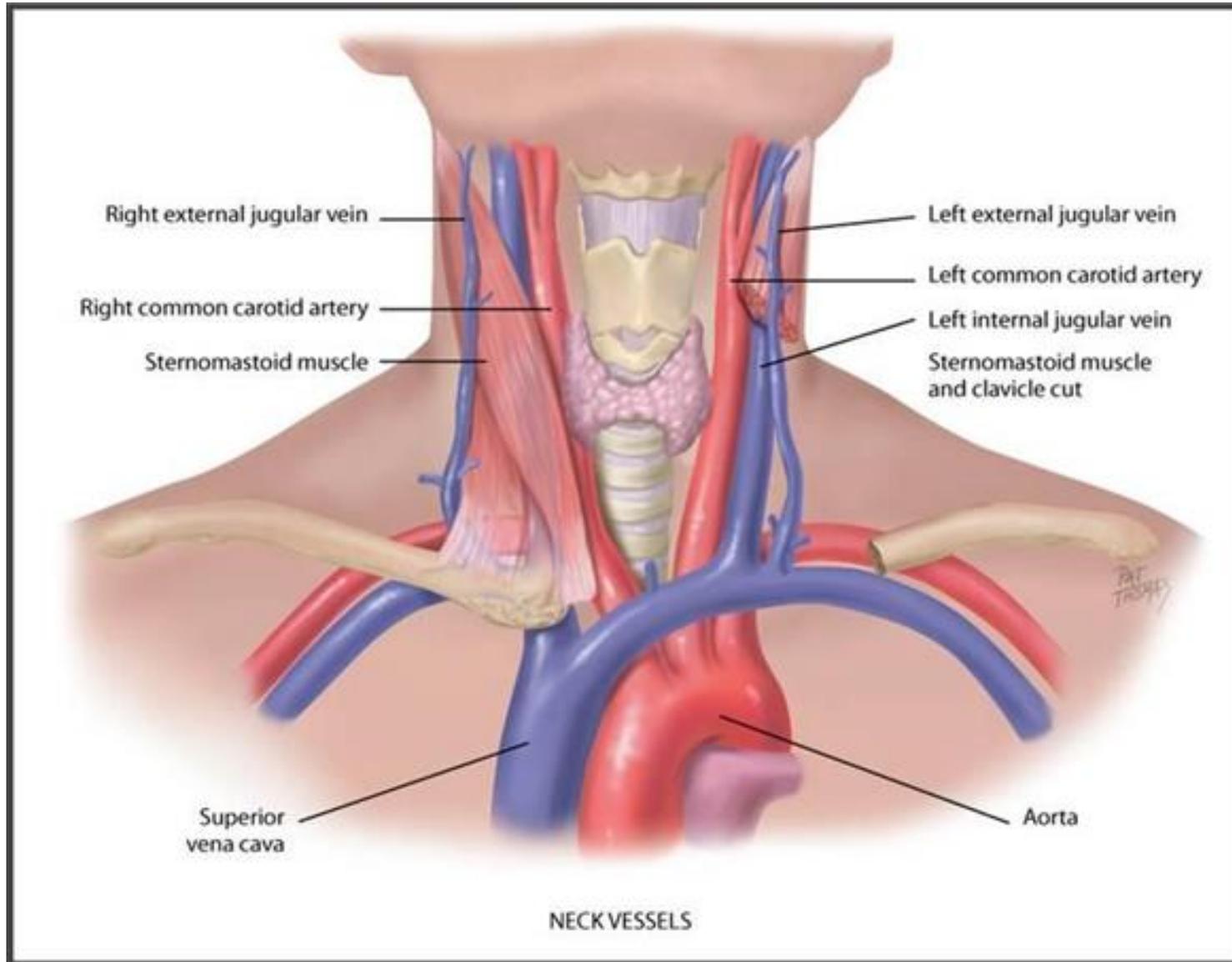


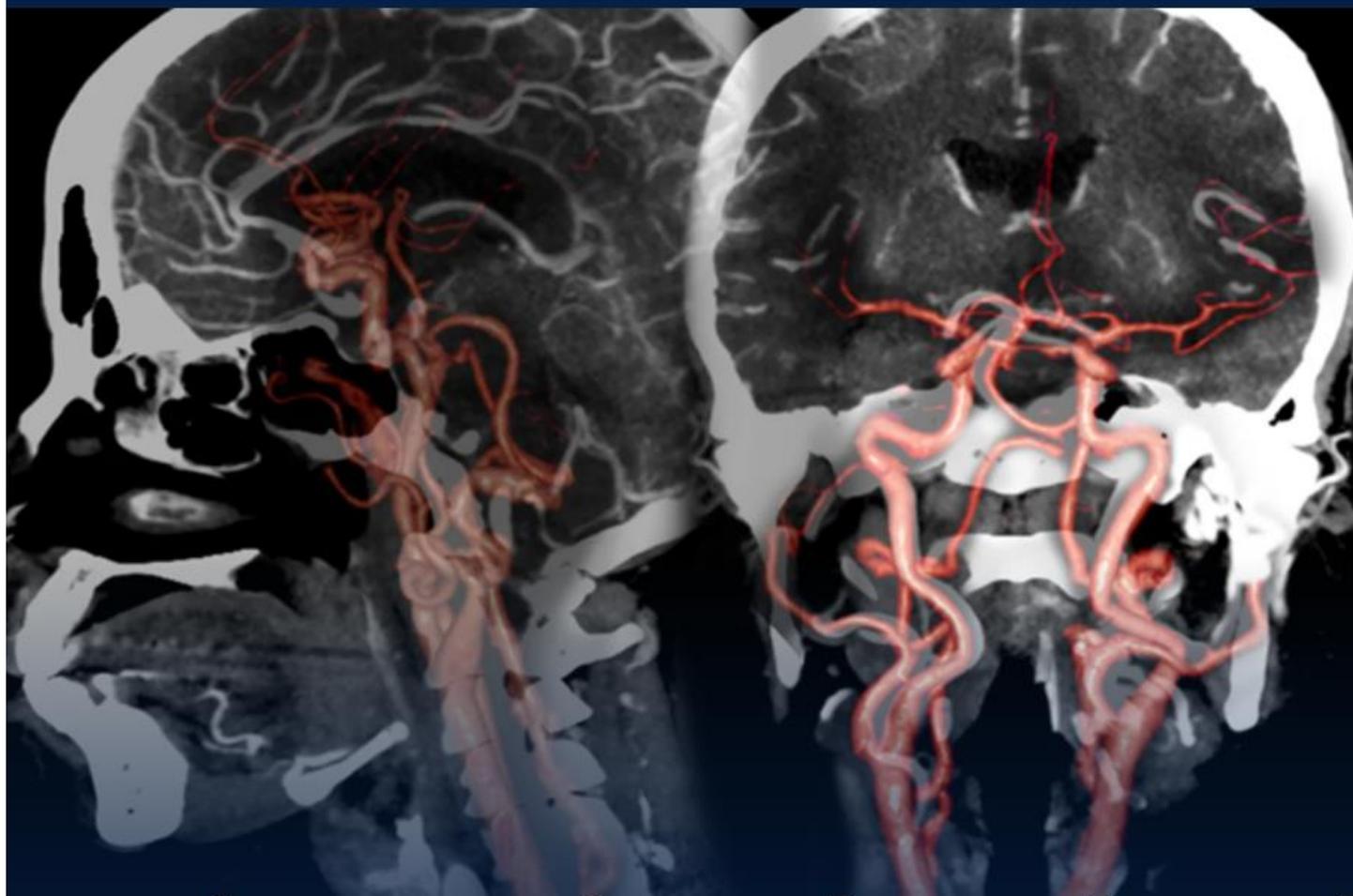


Food for Thought

Oxygen and glucose via the bloodstream







<https://www.ucsfhealth.org/medical-tests/ct-angiography---head-and-neck>



Traumatic Brain Injury (TBI)



Traumatic Brain Injury (TBI)



- ▶ External force
- ▶ Disrupts brain function
- ▶ Evidenced by at least one of the following:
 - Any loss of consciousness;
 - Loss of memory immediately pre- or post-incident;
 - Altered mental state at time of incident;
 - Focal neurologic deficit(s)

Types of Traumatic Brain Injury

- Scalp injury
- Skull fracture
- Brain injury
 - Concussion
 - Contusion
 - Intraparenchymal hemorrhage
 - Hematomas
 - Epidural
 - Subdural
 - Traumatic subarachnoid hemorrhage
 - Injury to axons [Diffuse Axonal Injury (DAI)]
- Blood vessel injury



Photo credit: CDC

Coup-contrecoup injury

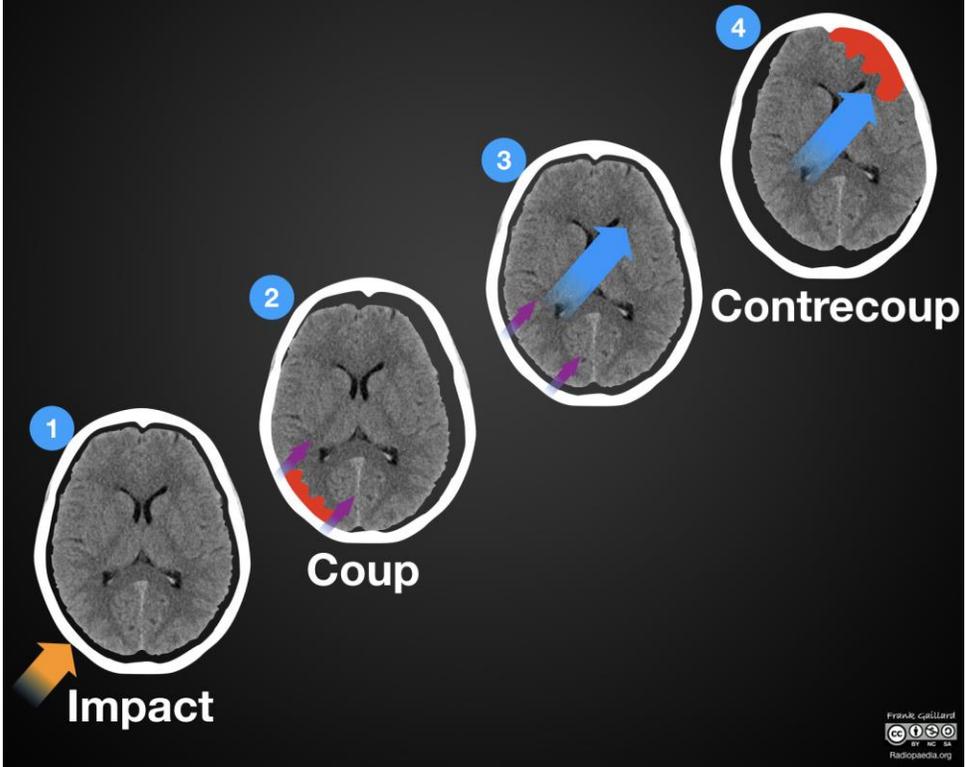


Photo credit: Frank Gaillard, Radiopaedia.org, rID: 55561

Diffuse axonal injury

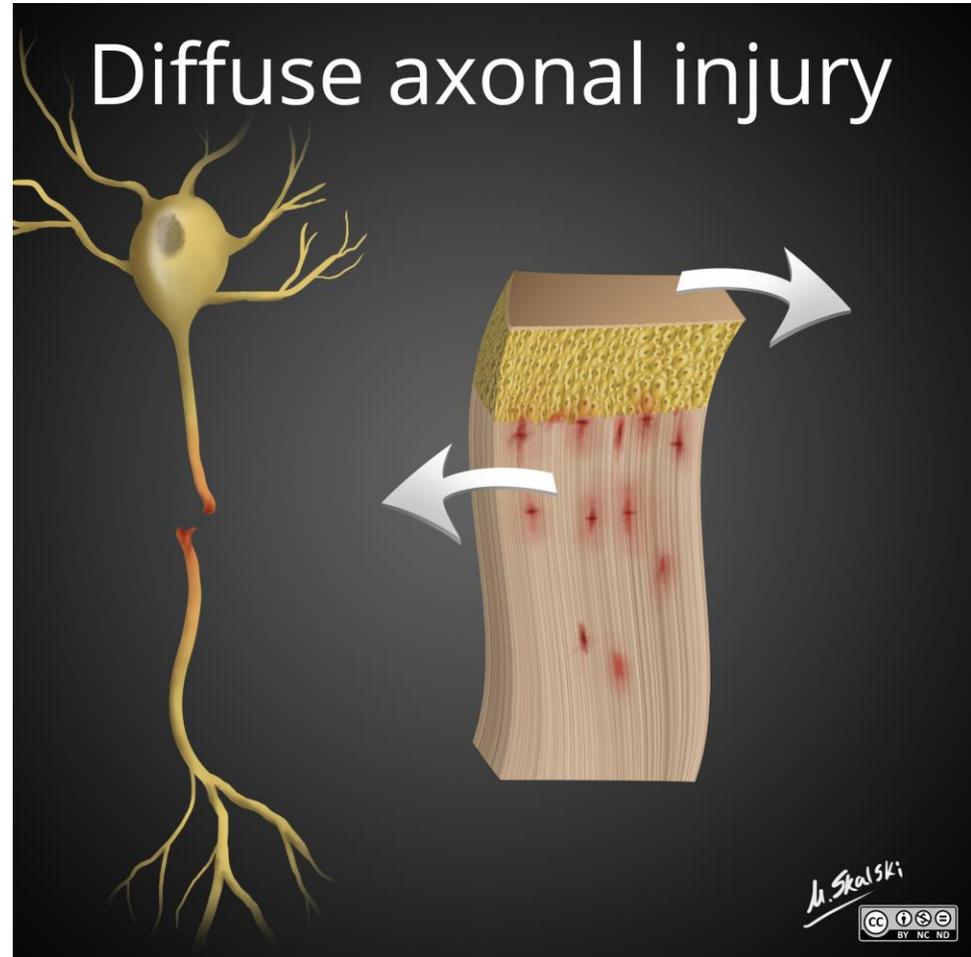
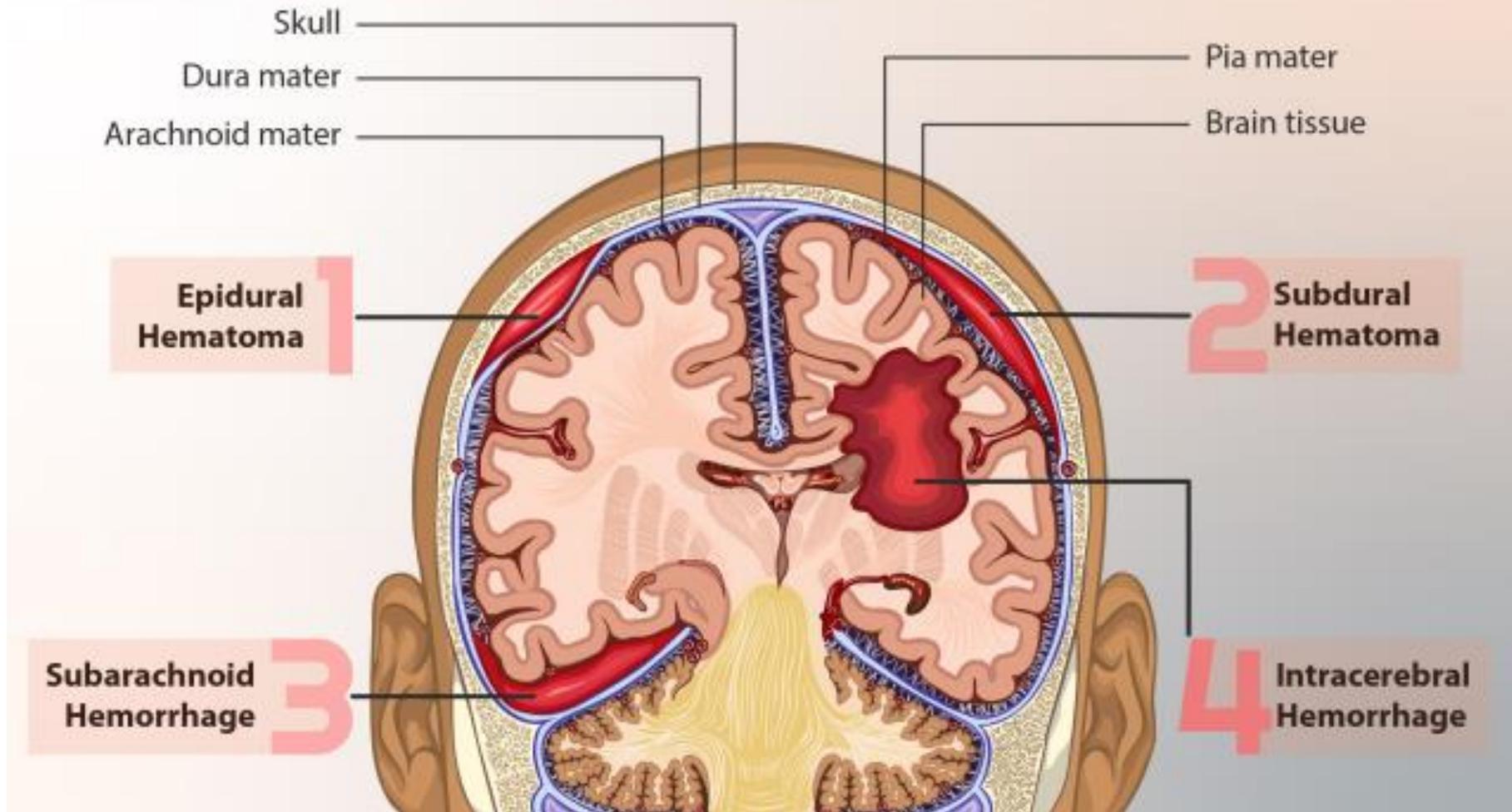


Photo credit: Matt Skalski, Radiopaedia.org, rID: 38437

Types of brain hemorrhage



6/20/2024

Mechanisms of Traumatic Brain Injury

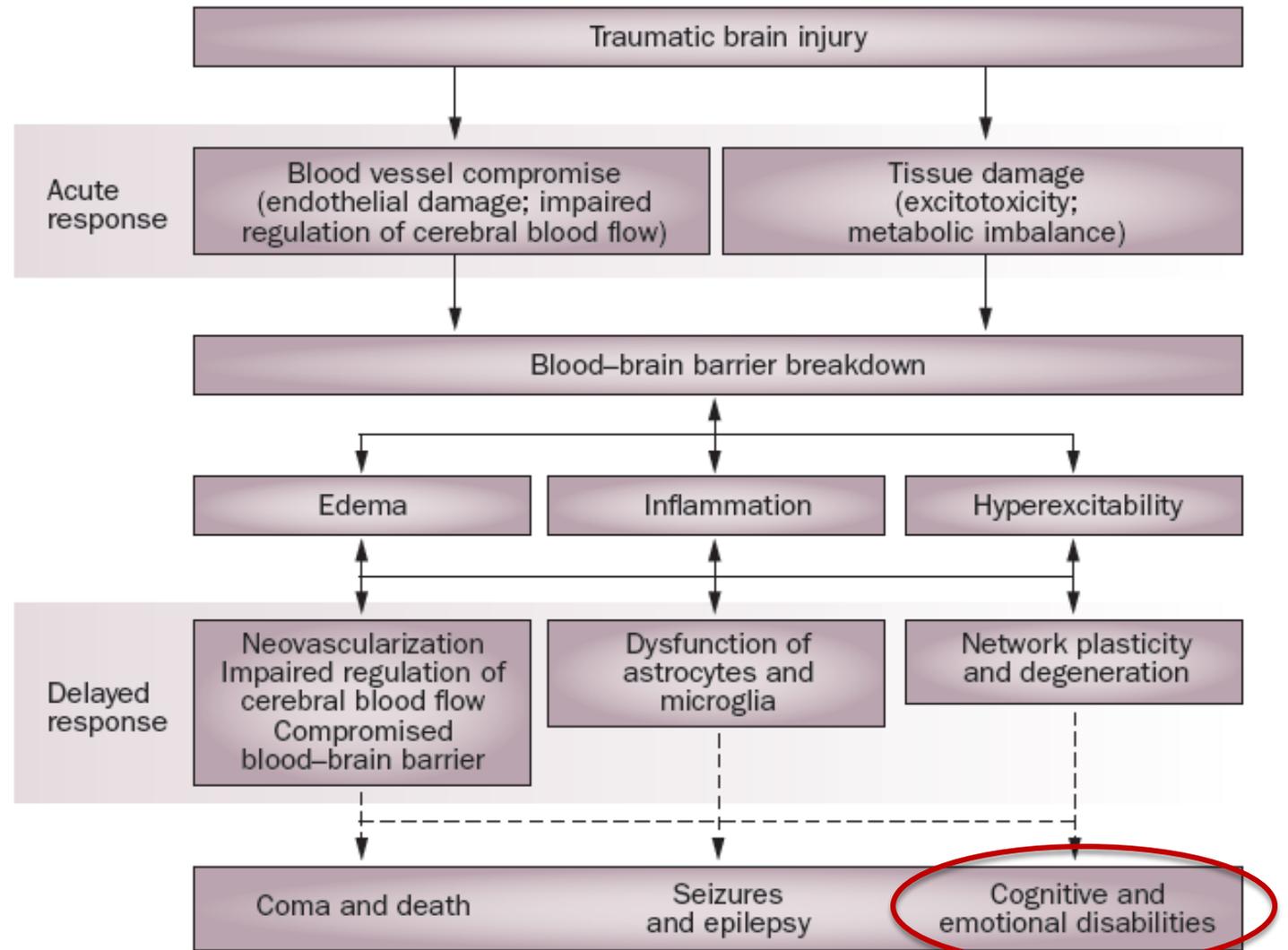


PRIMARY INJURY: DIRECT BLOW TO THE HEAD, NECK OR BODY RESULTING IN FORCE TRANSMITTED TO THE BRAIN



SECONDARY INJURY: NEUROTRANSMITTER AND METABOLIC CASCADE, CHANGES IN CEREBRAL BLOOD FLOW AND INFLAMMATION

- Acute and Delayed Responses to Injury

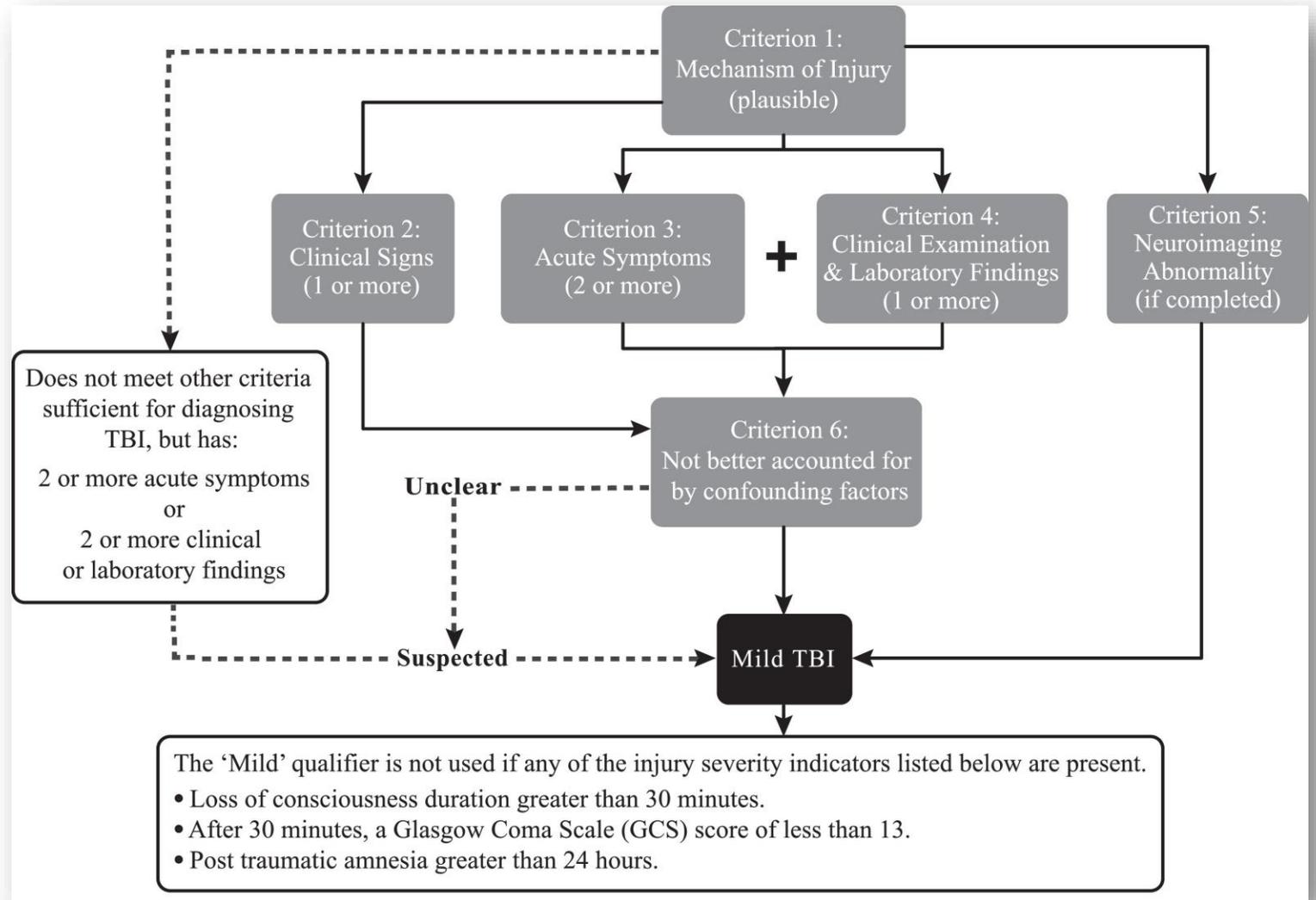




Traumatic Brain Injury Classification

	Mild	Moderate	Severe
Loss of consciousness	≤ 30 minutes	>30 minutes and <24 hours	≥ 24 hours
Post-traumatic amnesia	≤ 24 hours	> 24 hours and < 7 days	≥ 7 days
Abnormalities on imaging	no	yes	yes
Glasgow Coma Scale (clinical severity grading, 3 worst-15 best)	15-13	12-9	3-8

American Congress of Rehabilitation Medicine Diagnostic Criteria for Mild Traumatic Brain Injury (2023)



“Concussion” Defined

A traumatic brain injury caused by a direct blow to the head, neck or body resulting in force being transmitted to the brain.

Force initiates a neurotransmitter and metabolic cascade, blood flow change and inflammation affecting the brain.

Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged.

Often used synonymously with “mild TBI” or “mTBI.”



Women & Concussions

Why Concussions Might Affect Women Differently Than Men

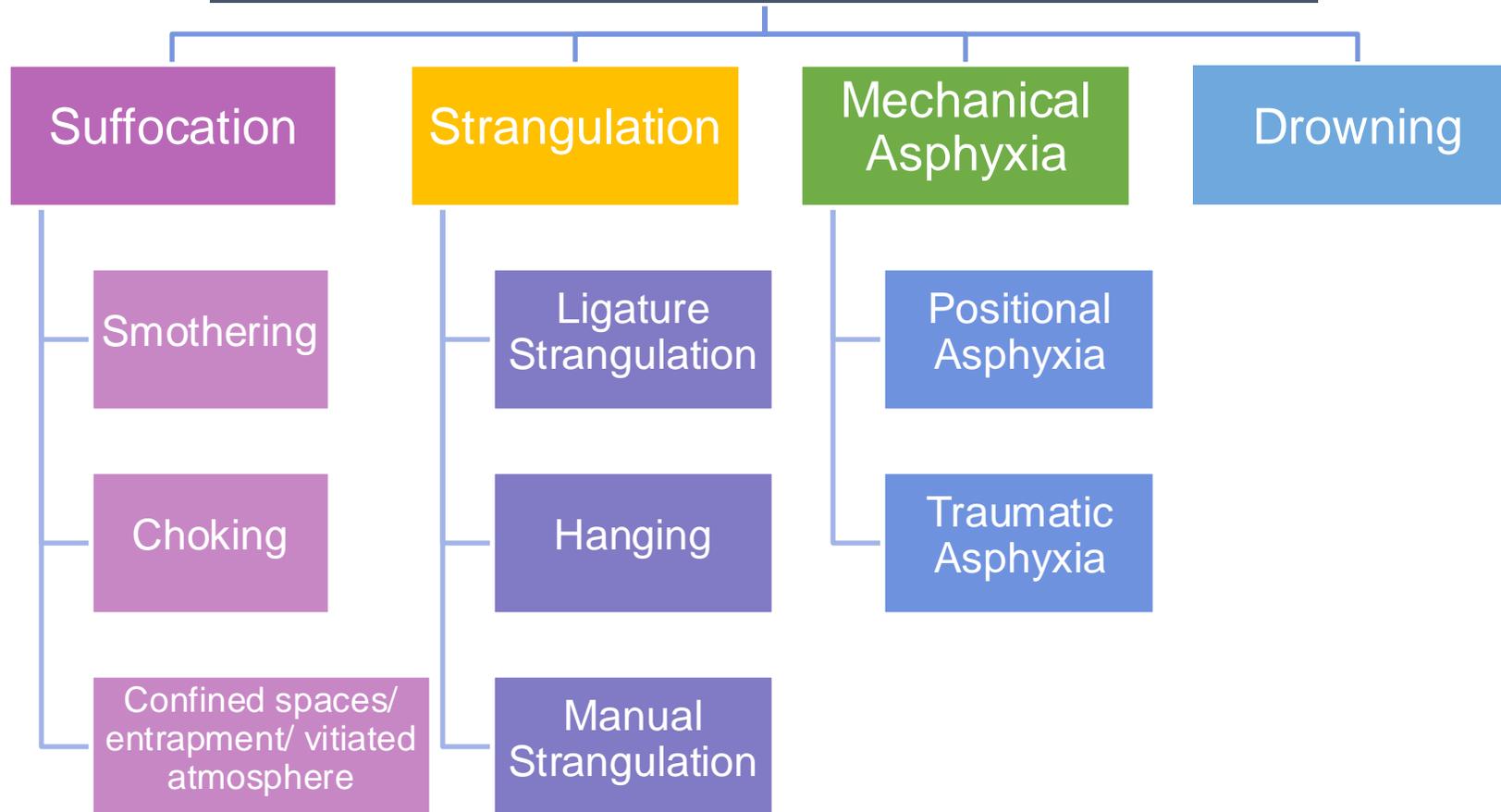
It is unclear why women appear to be at higher risk for sports-related concussions than men or why, following a head injury, women experience more symptoms – and more severe ones – such as greater cognitive decline, poorer reaction times, more headaches, extended periods of depression, longer hospital stays, , higher percentage of prolonged concussion symptoms, and delayed return-to-work compared to their male counterparts.⁵



Anoxic Injury: Strangulation



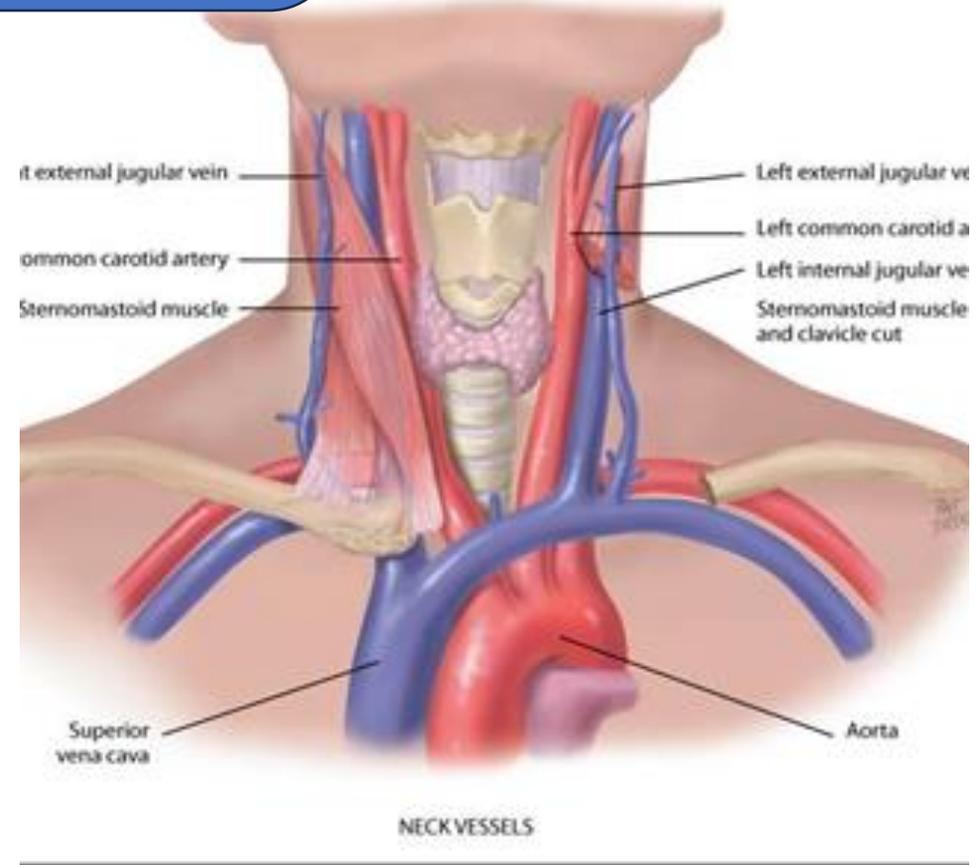
Asphyxia In Forensic Context



Strangulation

"He'd grab me by the neck, threaten to backhand me, choke me, grab and hurt me leaving many bruises..."
-Fatal Peril, pg. 71

- External pressure to the neck that closes blood vessels and/or air passages and deprives person of oxygen¹
- Less pressure than needed to open a can of soda²
- Loss of consciousness in 5-10 seconds, death in minutes³



¹Sauvageau, 2010; ²Training Institute on Strangulation Prevention, 2015; ³Huether & McCance, 2000

Types of Strangulation

Sauvageau, 2010

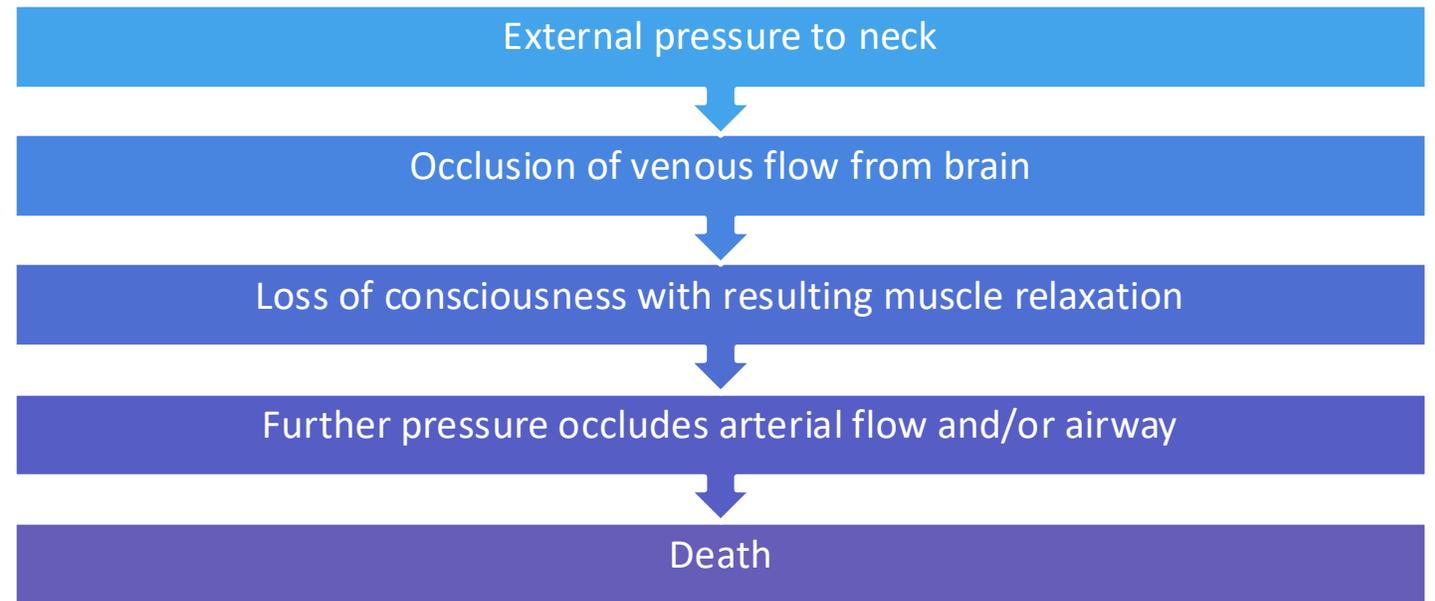
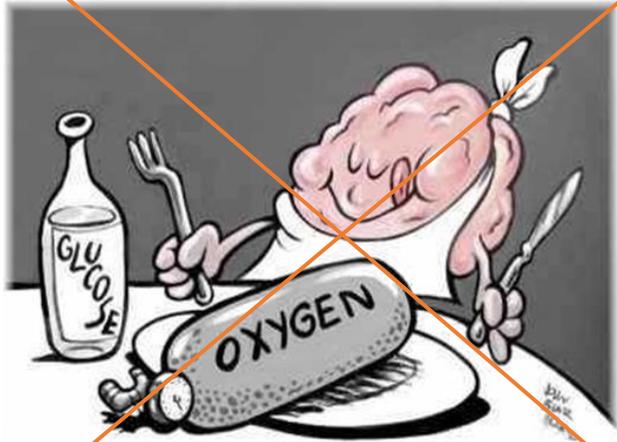
- Manual/"Throttling"/"Choking"
- Ligature
- Hanging
- Postural

"He would **choke** me, body slam me on counter tops, slap me, and tell me that he would kill us both if I try to leave him. He even chipped my teeth..."

-Fatal Peril, page 70



The Mechanics of Strangulation

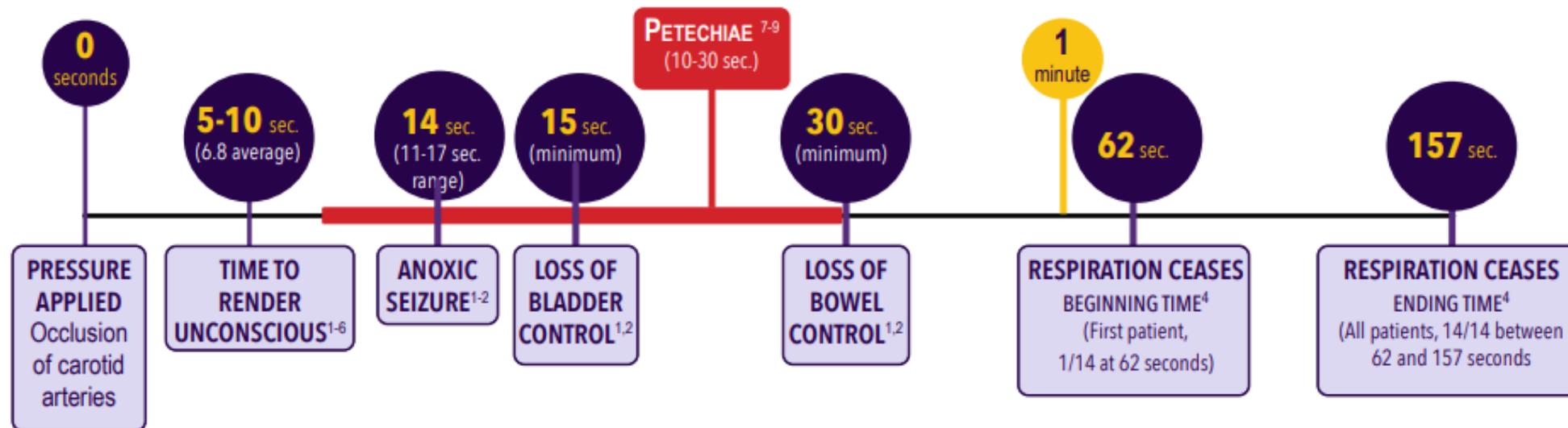


[Possible cardiac dysrhythmia from carotid body reflex, thought to be uncommon]

PHYSIOLOGICAL CONSEQUENCES OF STRANGULATION

Occlusion of Arterial Blood Flow: Seconds to Minutes Timeline

CREATED BY: Ruth Carter; Bill Smock, MD; Gael Strack, JD; Sean Dugan, MD; Marisol Martinez, MA ; Yesenia Aceves; and Ashley Peck



REFERENCES AND RESOURCES

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- ² Smith BA, Clayton EW, Robertson D. Experimental arrest of cerebral blood flow in human subjects: the red wing studies revisited. *Perspect Biol Med*. 2011;54(2):121-131. doi:10.1353/pbm.2011.0018
- ³ Reay DT, Holloway GA Jr. Changes in carotid blood flow produced by neck compression. *Am J Forensic Med Pathol*. 1982;3(3):199-202. doi:10.1097/00000433-198209000-00002
- ⁴ Sauvageau A, Laharpe R, King D, et al. Agonal sequences in 14 filmed hangings with comments on the role of the type of suspension, ischemic habituation, and ethanol intoxication on the timing of agonal responses. *Am J Forensic Med Pathol*. 2011;32(2):104-107. doi:10.1097/PAF.0b013e3181efba3a
- ⁵ Mitchell JR, Roach DE, Tyberg JV, Belenkie I, Sheldon RS. Mechanism of loss of consciousness during vascular neck restraint. *J Appl Physiol* (1985). 2012;112(3):396-402. doi:10.1152/jappphysiol.00592.2011
- ⁶ Stellpflug SJ, Menton WH, Dummer MF, et al. Time to unconsciousness from sportive chokes in fully resisting highly trained combatants. *International Journal of Performance Analysis in Sport*. 2020; 20(4):720-728. doi:10.1080/24748668.2020.1780873
- ⁷ Copley AL & Kozam G. Capillary Fragility and the Ecchymosis Test in Man. *Journal of Applied Physiology*. 1951;4(4):311-327. doi:10.1152/jappphysiol.1951.4.4.311
- ⁸ Anscombe AM, Knight BH. Case report. Delayed death after pressure on the neck: possible causal mechanisms and implications for mode of death in manual strangulation discussed. *Forensic Sci Int*. 1996;78(3):193-197. doi:10.1016/0379-0738(95)01886-7
- ⁹ Stapczynski JS. Strangulation injuries: *Emergency Medicine Reports*; 2010. 31(17):193-203. <https://www.reliasmedia.com/articles/19950-strangulation-injuries>

Statistics, injuries



Intimate Partner Violence

Intimate Partner Violence (IPV)

- Sometimes used interchangeably with “domestic violence”
- Intimate partner:
 - Close personal relationship
 - E.g., emotional connectedness, regular contact, familiar with each other’s lives, identify as a couple, ongoing physical/sexual contact
 - Does not require sexual intimacy
 - May or may not live together
 - May be opposite- or same-sex
 - Includes:
 - Current or former spouse (married, common-law, civil union, domestic partners)
 - Current or former dating partner, boyfriends/girlfriends



Intimate Partner Violence (IPV)

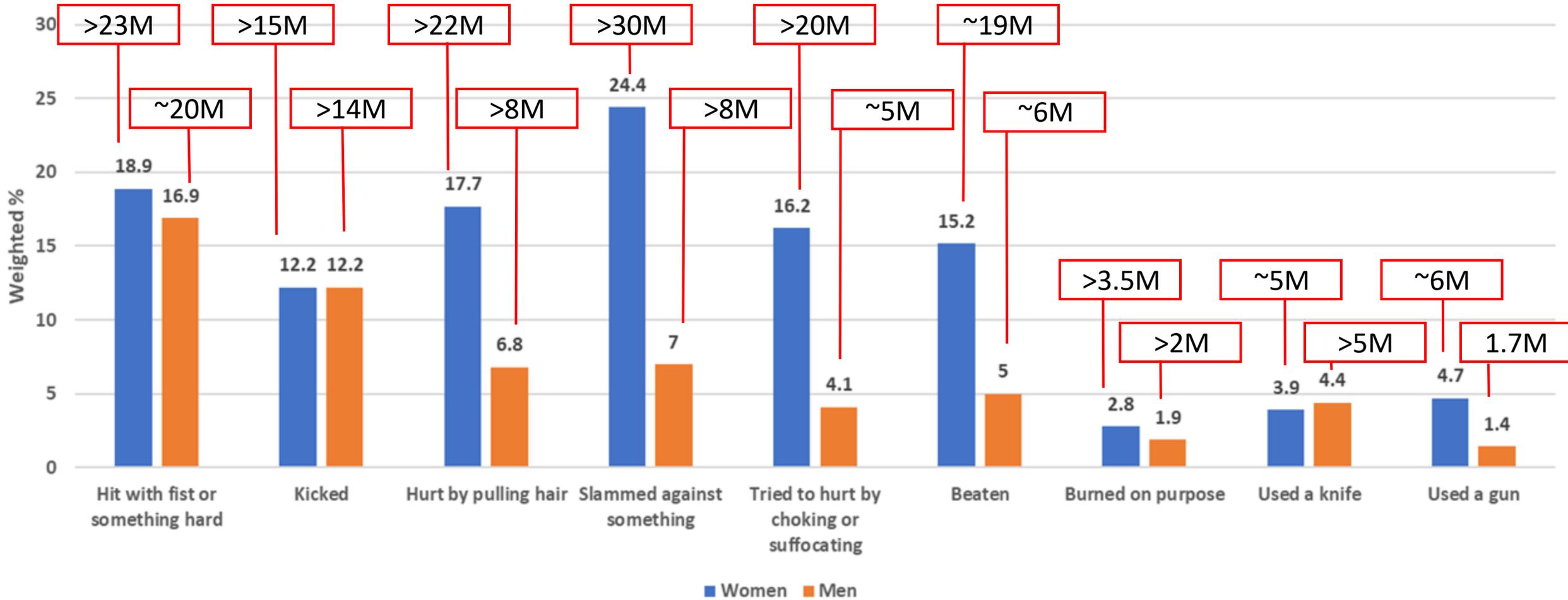
- Violence or aggression:
 - Varies in frequency, severity, type
 - Occurs on a continuum
 - Includes four types of behavior:
 - Physical violence 
 - Hurting or attempting to hurt a partner by hitting, kicking, or using another type of physical force
 - Sexual violence
 - Psychological aggression resulting in harm
 - Stalking



CDC, 2022

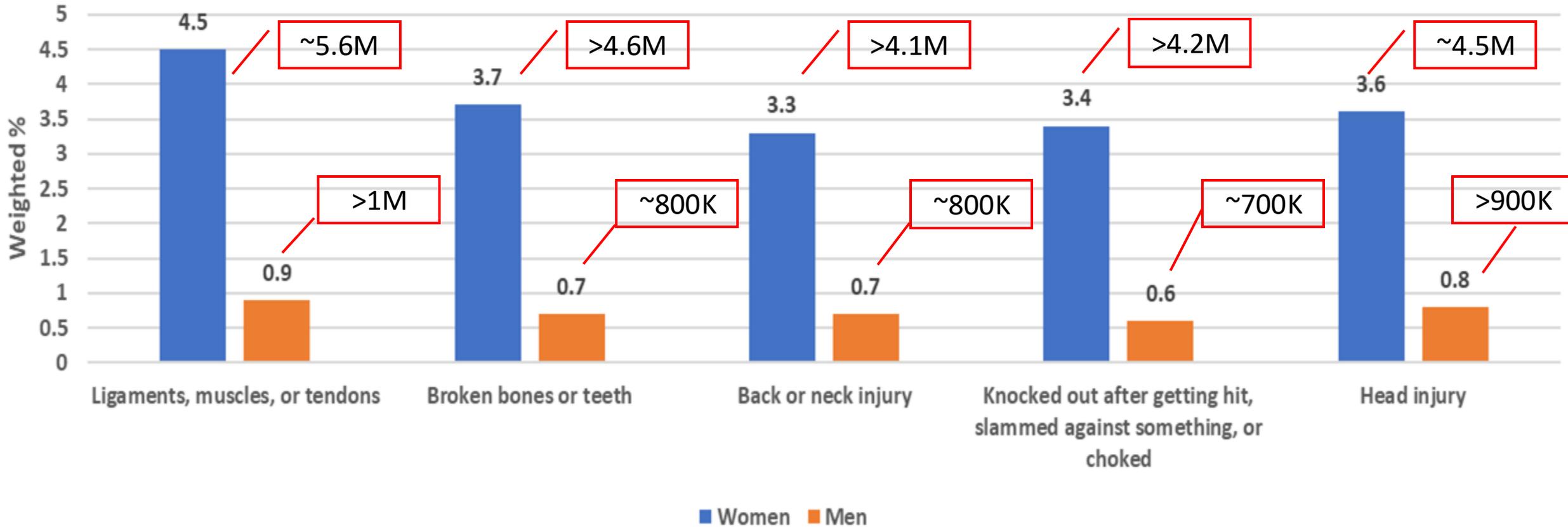
Lifetime Prevalence of Severe Physical Violence by an Intimate Partner

Adapted from the U.S. National Intimate Partner and Sexual Violence Survey
2016/2017 Annualized Estimates



Derived from Leemis et al., 2022

Lifetime Prevalence of Contact Sexual Violence, Physical Violence, and/or Stalking by an Intimate Partner with IPV-Related Impact
 Adapted from the U.S. National Intimate Partner and Sexual Violence Survey
 2016/2017 Annualized Estimates



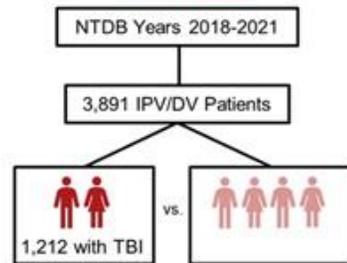
Epidemiology of Intimate Partner and Domestic Violence-Related Traumatic Brain Injury in the United States, 2018-2021: A National Trauma Data Bank Cohort Analysis of 3,891 Patients

Objectives

Characterize TBI and non-TBI injuries from intimate partner and domestic violence (IPV/DV) in the United States (US) from 2018-2021.

Evaluate the hypothesis that IPV/DV-TBI is associated with higher morbidity compared to IPV/DV non-TBI injuries.

Methods



Multivariable regressions examined associations between TBI and outcomes using adjusted odds ratios (aOR) and adjusted mean differences (aMD).

Key Findings

IPV/DV TBI and non-TBI cohorts had higher proportions of female and Black patients compared to the general US population. In IPV/DV-TBI:



TBI was associated with:

↑ ICU Admission
aOR = 4.29 [3.46-5.33]

↑ Length of Stay
aMD = +1.22 [0.68-1.76]

↑ Hospital Mortality
aOR = 3.20 [1.99-5.15]

↓ Discharge Home
aOR = 0.57 [0.46-0.71]

Conclusions

Female and Black patients were overrepresented in IPV/DV cohorts.

IPV/DV-TBI had higher odds of ICU admission, mortality, inability to discharge home, and increased LOS compared to IPV/DV non-TBI.

Provision of socio-medical resources during acute hospitalization is critically needed to support this vulnerable population.

Neurosurgery

Ramesh et al



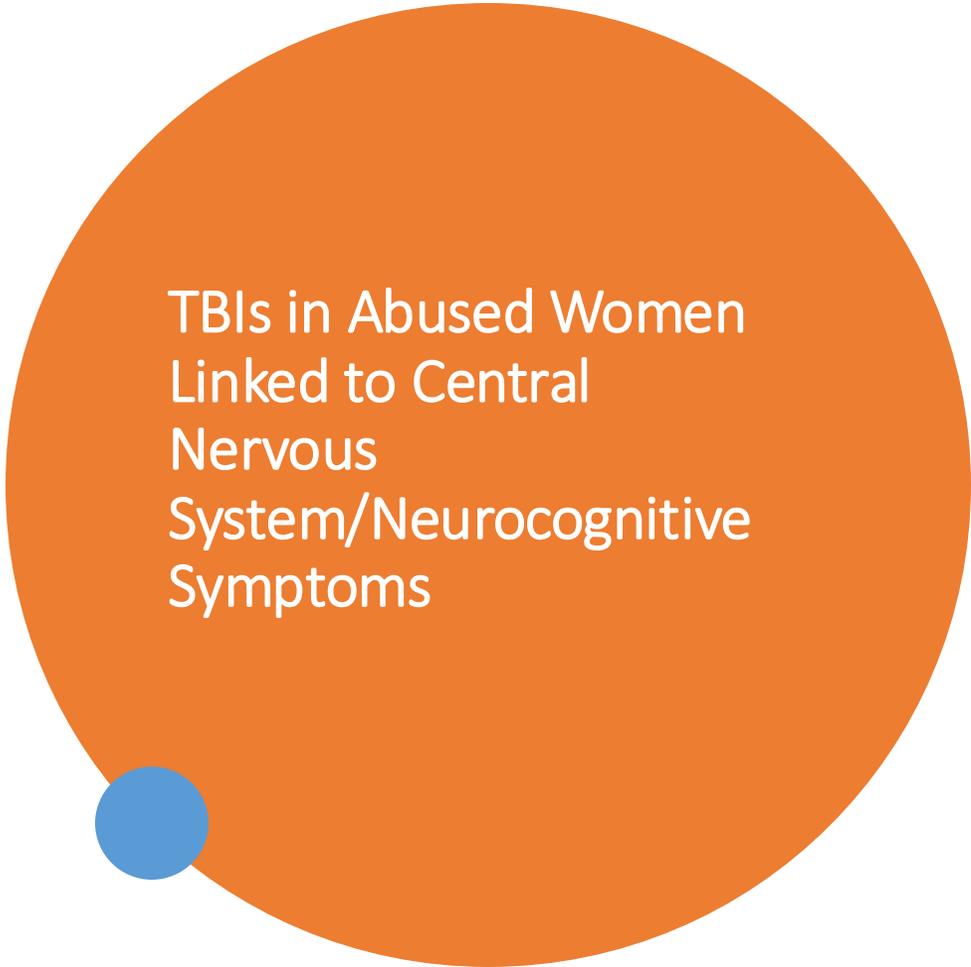
Published by Wolters Kluwer on behalf of the Congress of Neurological Surgeons



Intimate Partner Strangulation of Women Risk for Fatality

- 43% of women murdered and 45% of women almost murdered by a partner were previously strangled¹
- Prior NF-IPS of women associated with over 6-fold odds of attempted homicide and over 7-fold odds of completed homicide¹
- Delayed death may occur from stroke²
- Can be fatal even without any external injuries³

Signs, Symptoms, and Health Consequences of IPV-Related Brain Injury

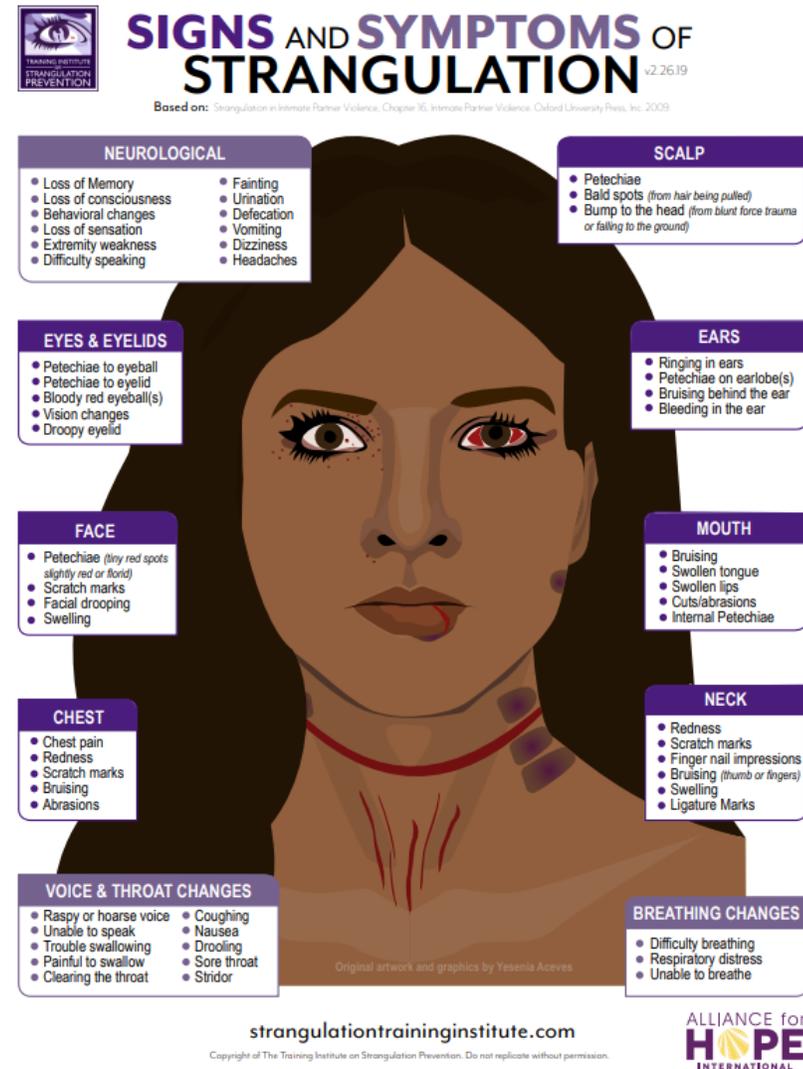


TBIs in Abused Women Linked to Central Nervous System/Neurocognitive Symptoms

- Significantly more central nervous system symptoms than non-abused
- Trouble concentrating, memory problems, fainting/dizzy spells
- More frequent strangulation (5+ vs 2 or fewer) = more symptoms
- Memory, depression, insomnia, headaches, dizziness, and loss of sensation
- Blunt force: TBI often have symptoms like headaches, dizziness, memory loss, insomnia, depression, apathy, and fatigue

Strangulation: Morbidity/ Mortality

- Potentially devastating acute and long-term health outcomes¹⁻⁶
 - E.g., cervical artery injuries, carotid dissections, traumatic brain injuries, PTSD, miscarriage
 - Multiple strangulation associated with increased injury
- Can be more challenging to identify in those with darker skin tones⁷
- 43% of women murdered and 45% of women almost murdered by a partner were previously strangled¹
- Can be fatal without external injuries⁸



TISP, 2019

¹Glass et al. (2008); ²Wilbur et al. (2001); ³Nash & Sheridan (2007); ⁴Valera & Kucyi (2016); ⁵Kwako et al. (2011); ⁶Messing et al., 2018; ⁷Scafide et al., 2022; ⁸Hawley et al (2001)

Signs & Symptoms of Traumatic Brain Injury

Red Flag Symptoms

That warrant immediate medical attention

-  Neck pain
-  Loss of consciousness, in and out of consciousness
-  Confusion or irritability
-  Severe or worsening headache
-  Repeated vomiting
-  Unusual changes in behaviour
-  Seizures or convulsions
-  Double vision
-  Weakness, tingling or burning of the limbs

Common Symptoms

PHYSICAL

- Headaches
- Tinnitus (ringing in your ears)
- Chronic fatigue (both mental and physical)
- Nausea and vomiting
- Dizziness
- Blurred vision
- Changes to your menstrual cycle

COGNITIVE CHALLENGES

- Decision making / judgement
- Reasoning / impulsivity
- Multi-tasking
- Concentration
- Memory storage and/or recall
- Organization
- Slowed thinking
- Inability to read facial expressions
- Communication

SLEEP

- Sleeping more or less than usual
- Sleeping at odd times of day
- Trouble falling asleep
- Not feeling rested after sleeping

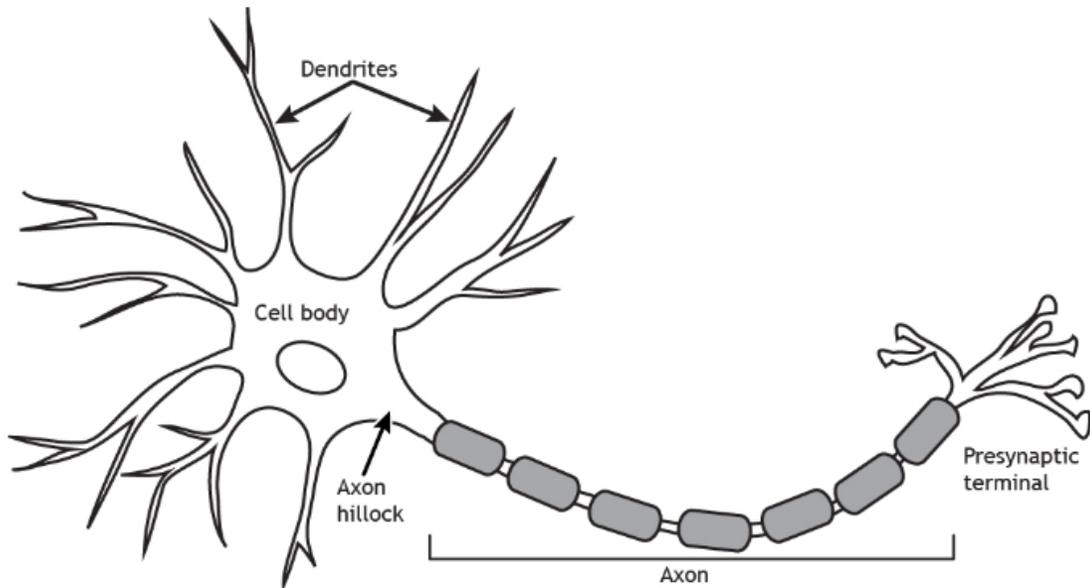
PSYCHOLOGICAL

- Depression
- Anxiety
- Outbursts of anger and irritability
- Emotional lability (easy mood swings that can change quickly)
- Changes to personality



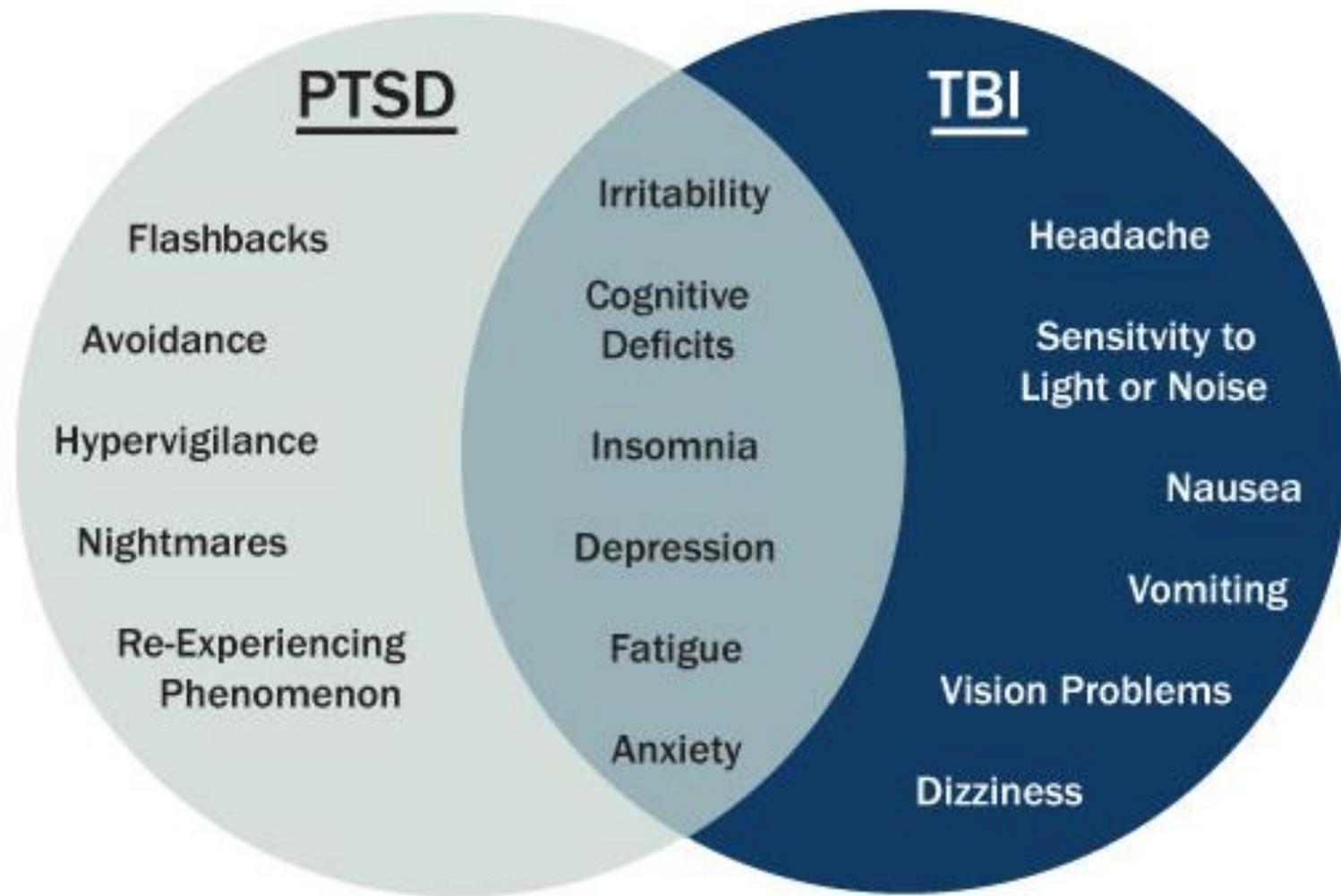
For more information please visit the Abused & Brain Injured Toolkit at abitoolkit.ca

Connecting Biology to Symptoms



Concussion Symptom	Biological Correlate/Cause
Headache, sensitivity to light and sound	Changes in concentrations of ions
Vulnerability to a second injury, worsening symptoms	Energy depletion [crisis] in the brain
Difficulties thinking, processing [executive functioning], slowed response	Damage to axons, disruption in transmission of messages in the nervous system
Chronic atrophy, persistent impairment	Cell death, alterations to cells and enzymes

Giza, 2014



Reference: Stein MB, McCallister TW (2009). Exploring the convergence of post-traumatic stress disorder and mild traumatic brain injury. Am J Psychiatry; 166:766-776.

Executive Functioning

Executive Function

Examples of executive function are:



Working memory.



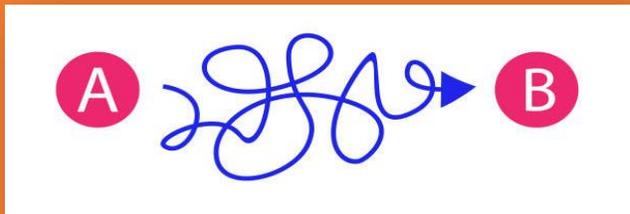
Inhibition control.



Cognitive flexibility:
planning, reasoning, solving problems, multitasking.

 Cleveland Clinic

Potential Cognitive Difficulties



Decreased ability to:

- Concentrate
- Solve problems
- Think straight
- Think abstractly
- Learn new information
- Follow complicated directions
- Identify objects and their functions
- Spell, write, read and work with numbers
- Communicate
- Prioritize

Problems with:

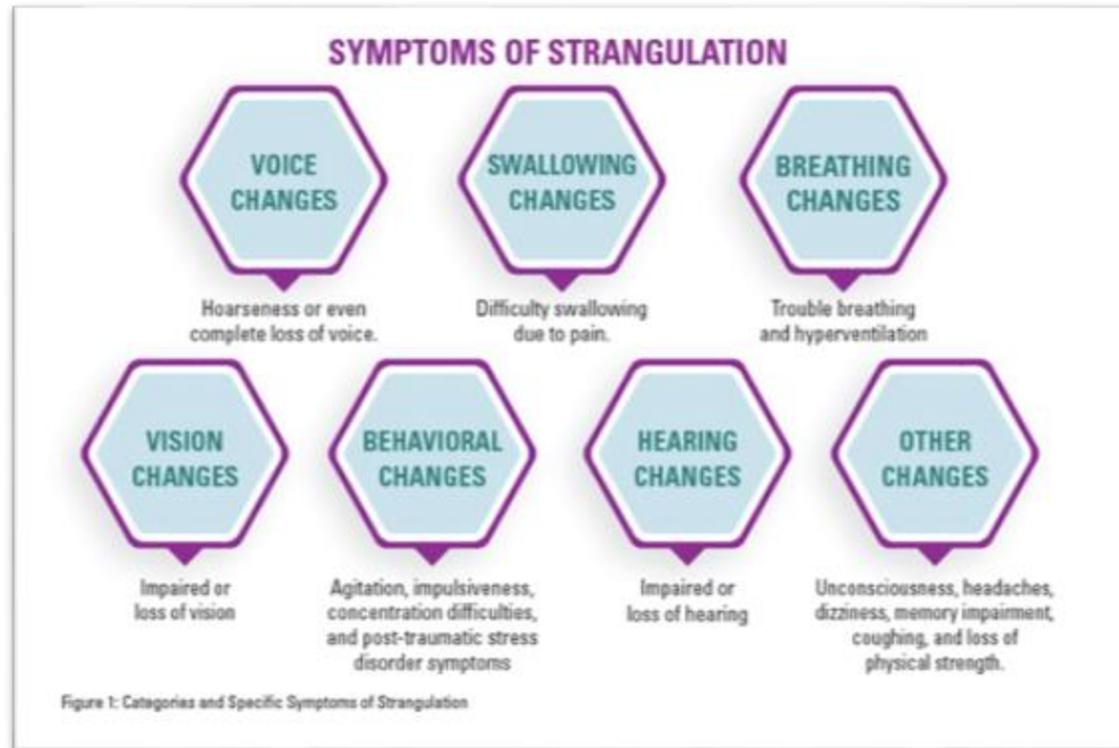
- Reduced attention span
- Short-term and/or long-term memory loss; memory distortions
 - “I can’t remember squat!”
- Disorganization
 - “My CPS worker is mad at me because I keep missing appointments...I’m afraid I’ll lose my kids.”

Examples of Hypoxic/Anoxic Injury

Symptoms and Health Consequences

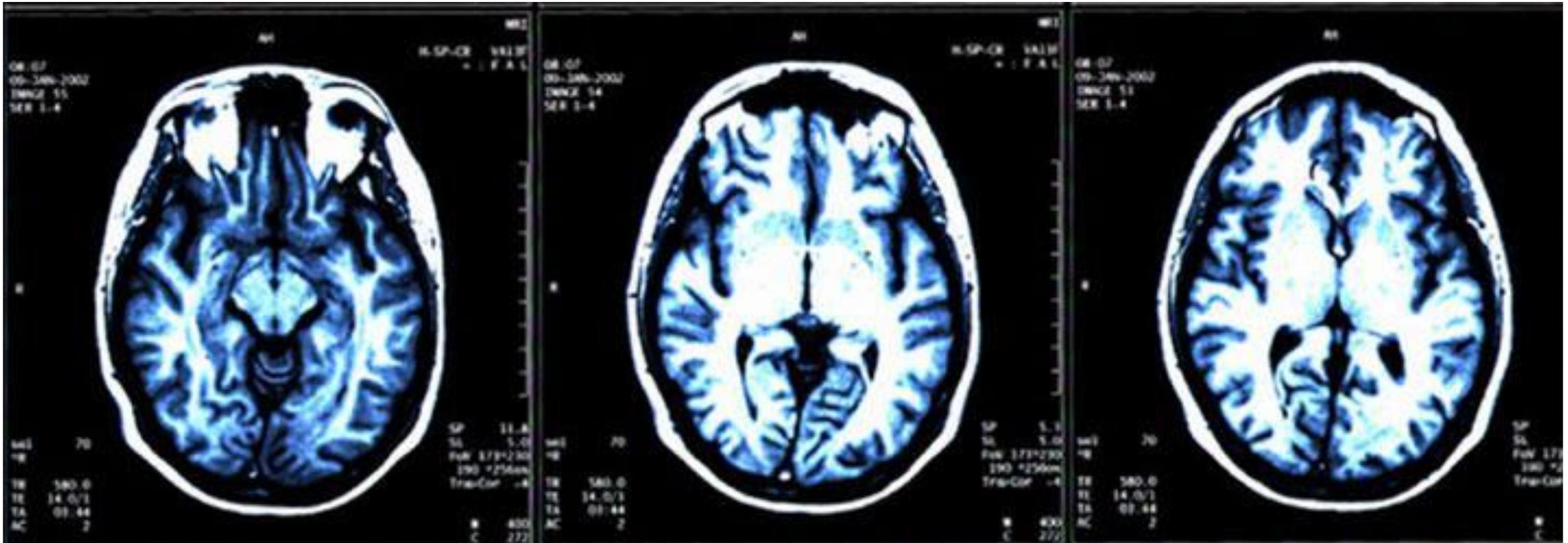
Short-Term
Trouble concentrating
Poor coordination
Headaches
Dizziness
Light-headedness
Confusion
Loss of consciousness
Skin appearing blue

Long-Term
Motor function disturbance
Spasticity
Tremors
Cortical blindness
Memory problems
Speech impairments
Increased irritability and frustration
Fatigue
Low blood pressure



Functional Recovery from TBI

- Can be difficult to predict
- May depend on severity of injury, age, genetics, repetitive injury
- Team approach



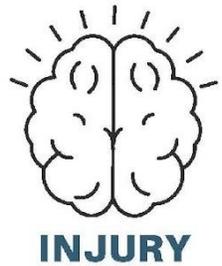
Many Survivors Hesitate to Seek Help for IPV-Related Brain Injury

- Cognitive symptoms
- Safety concerns/partner manipulation
- Shame, stigma, or worry about abuse and/or being “brain injured”
- Fear of losing custody of their children
- Fear of getting partner in trouble
 - Especially, if economically dependent
- Lack of transportation, health insurance
- **THEY MAY NOT KNOW THEY HAVE A BRAIN INJURY**



Examples of Supportive Responses and Resources

Recommended Treatment Timeline Following a Concussion*



IMMEDIATELY

ER/Urgent Care

- Rule out the need for CT, or neck injury
- Screen for co-morbid conditions
- Conduct a physical and cognitive exam
- Receive concussion education
- Have a follow-up plan with another provider

48-72 HOURS

Concussion Clinic

Follow-up with a physician and start step-by-step return to work/school/play protocols

Primary Care Physician

3-4 WEEKS

Symptom-Free

- Return to school/work/play
- Medical clearance for return to sport is required by state law

Persistent Symptoms

Seek care from a multidisciplinary clinic



*Based off the [2016 Consensus Statement of Concussion in Sport](#) and [2018 Ontario Neurotrauma Foundation Guidelines](#)

Ways to Help with Attention and Concentration Issues

- ▶ Decrease distractions, interruptions.
- ▶ Minimize bright lights, extraneous noise.
- ▶ Limit length of meetings/sessions and build in short breaks.
- ▶ Work on one task at a time (also helps with fatigue).
- ▶ Speak clearly and concisely.



Ways to Help with Information Processing and Memory

- Talk slowly, stay on point.
- Focus on one task at a time.
- Break information into small pieces.
- Double-check for understanding.
- Be factual, not abstract.
- Ask yes-or-no questions.
- Repeat, repeat, repeat.
- Give tasks in sequential steps.
- *Provide checklists, “to-do” lists.
- *Coaching on writing things down.
- *Consider apps and phone calendars/reminders.



Ways to Help with Executive Functioning Challenges

- Help prioritize goals and break them into small, tangible, sequential steps.
- Provide clear, detailed orders.
- Warm hand-off to advocates and other staff for assistance with forms and navigating court process.
- Allow extra time for task completion.
- Point out possible short- and long-term consequences of specific choices.
- Provide clear and specific feedback.





CARE Brain Injury Materials for Education and Service Providers:

The Center on Partner-Inflicted Brain Injury, Ohio Domestic Violence Network
<https://www.odvn.org/brain-injury/>



6/20/2024



What to Expect After Brain Injury

A guide for people with brain injury and their caregivers



DANGER ASSESSMENT

Updated
Danger
Assessment
Click here

CONTACT FAQs Search



The Danger Assessment

Training Options

In the Field

The **Danger Assessment** helps to determine the level of danger an abused woman has of being killed by her intimate partner.

take the training



<https://www.dangerassessment.org/>

Links to Other Resources



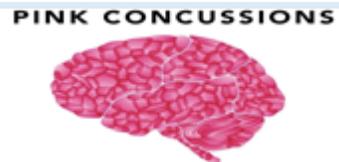
Futures Without Violence

- www.futureswithoutviolence.org



Training Institute on Strangulation Prevention

- <https://www.strangulationtraininginstitute.com/>



Pink Concussions

- <https://www.pinkconcussions.com/>

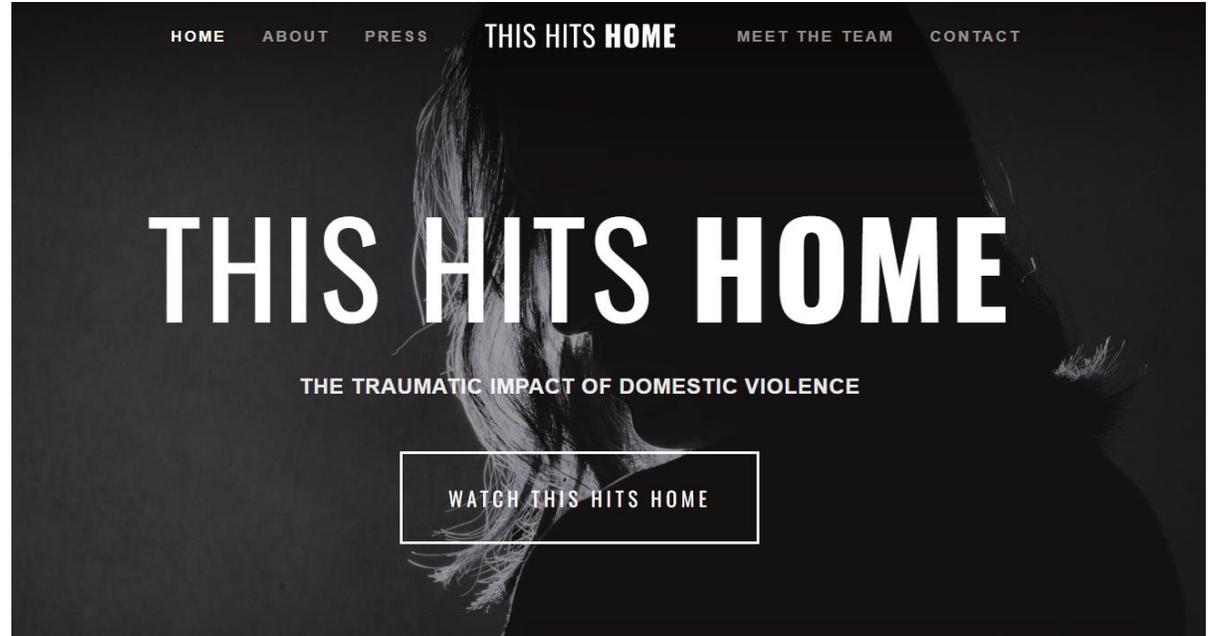
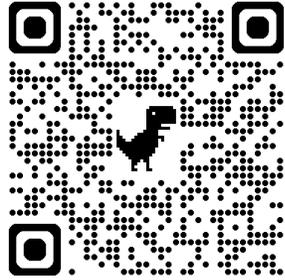


Brain Injury Association of America

- <https://www.biausa.org/>

Links to Other Resources

www.thishitshome.com

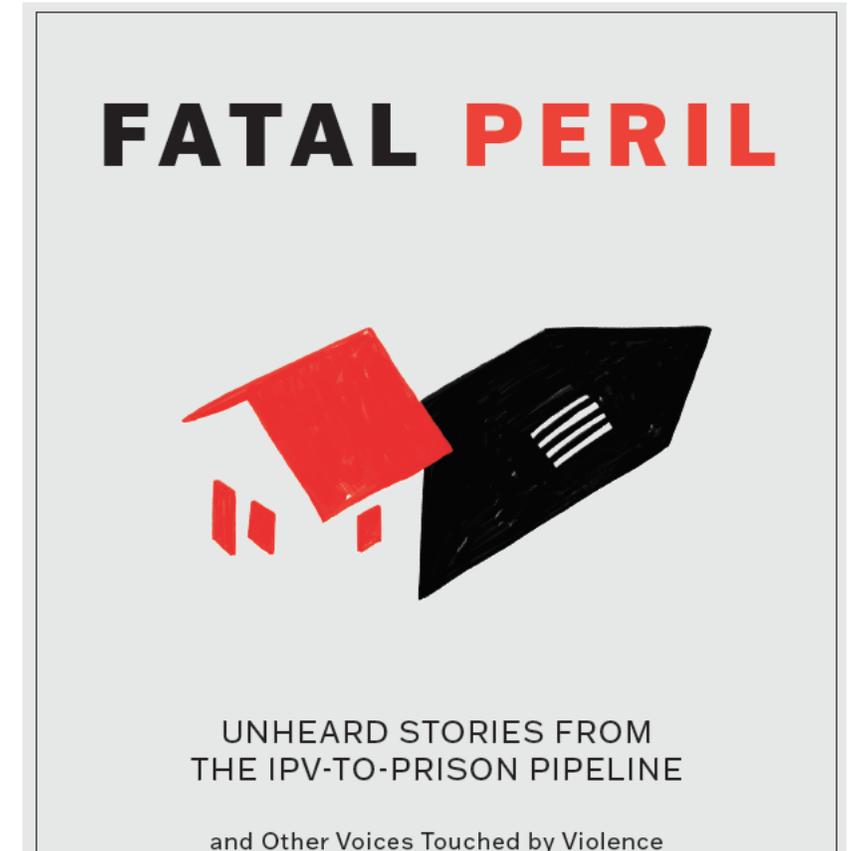


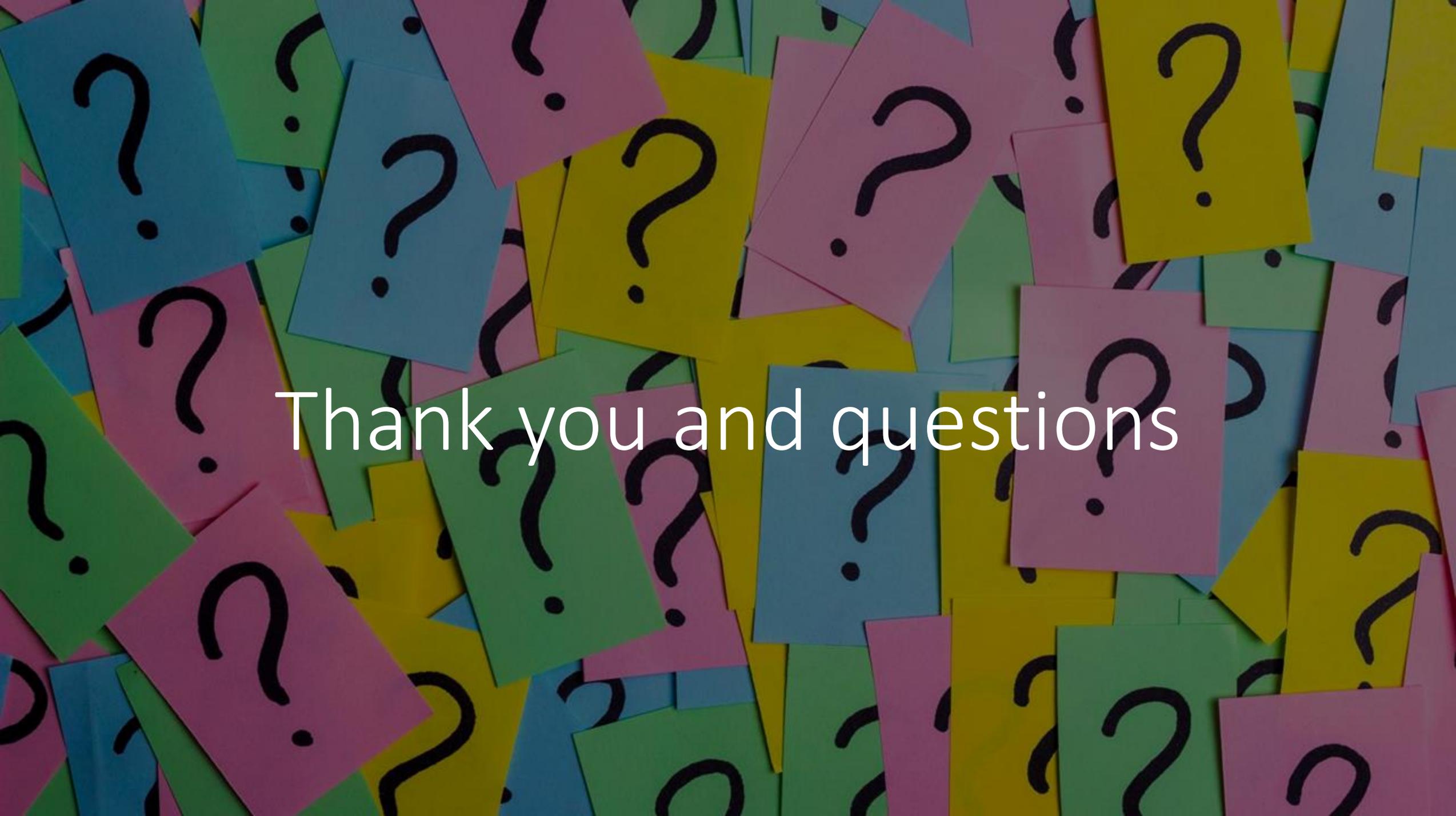
Further Reading

- <https://www.nytimes.com/2022/03/01/magazine/brain-trauma-domestic-violence.html>
- <https://www.newyorker.com/news/news-desk/the-unseen-victims-of-traumatic-brain-injury-from-domestic-violence>

Circling Back to *Fatal Peril* (2024)

- "A high percentage of people incarcerated in California's women's prisons for murder or manslaughter offenses report having experienced significant and potentially lethal IPV in the year preceding their offenses."
- "Our results suggest that TBI may be common in women prosecuted for and convicted of homicide."
- "The criminal legal system inconsistently screens for IPV and should make broader use of IPV screenings."
- The criminal legal system must account for how TBI-producing injuries affect survivor-defendants' ability to remember details, how well they can communicate those details, how convincing they sound, whether their demeanor matches listeners' expectations, and whether they appear properly remorseful."
- "Corrections officials should assess and make accommodations for incarcerated people with TBIs that address myriad long-term outcomes, including problems with balance, vision changes, headaches, sensitivity to light and sound, poor memory and cognitive deficits, and other symptoms."



The background consists of a dense, overlapping field of small, rectangular sticky notes. Each note is a different color, including shades of blue, green, yellow, and pink. Every note has a large, bold, black question mark printed on it. The notes are scattered across the entire frame, creating a textured, busy appearance.

Thank you and questions

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