ECHO IDAHO

Counseling Techniques for Substance Use Disorders

Treatment of SUD in patients with TBI

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Project ECHO

Learning Objectives

- Review the basics of traumatic brain injury
- Discuss the directional relationship between TBI and SUD
- Review screening recommendations for TBI in SUD patients
- Review treatment recommendations/accomodations for SUD patients with a history of TBI

Overview:
Why are we talking about TBI?

Overview

- **TBI is common in the U.S.: ~2.8–2.9 million TBIs occur annually (**likely an underestimate)
  - ~215,000 hospitalizations and ~70,000 deaths annually (2020/2021 CDC data)

- **Bidirectional link between TBI and SUDs:**
  - **SUDs are extremely common in TBI populations:**
    - ~60% of individuals with a history of TBI have a cooccurring SUD
  - **TBI is extremely common in SUD populations:**
    - ~**48–80%** of patients with SUDs have a lifetime history of TBI
    - Clinically significant injury is frequent among SUD patients with TBI history
      - ~25% report at least one moderate or severe TBI
      - Moderate/severe TBI is more likely to result in persistent neurological deficits

Overview

- **TBI called a “silent epidemic”**
  - TBI is often unrecognized by medical and behavioral health providers.
  - Mild TBI can cause subtle cognitive and executive deficits that impair coping and learning

- **TBI is associated with increased SUD severity:**
  - Heavier substance use
  - Greater psychiatric symptom burden
  - May increase high risk behaviors

- **Unrecognized TBI can undermine engagement, retention, and effectiveness of standard SUD treatment**
  - Professionals working SUD-settings need skills to recognize and treat TBI
  - Knowledge gaps remain in prevalence and treatment of co-occurring TBI and SUD.

Traumatic Brain Injury 101:

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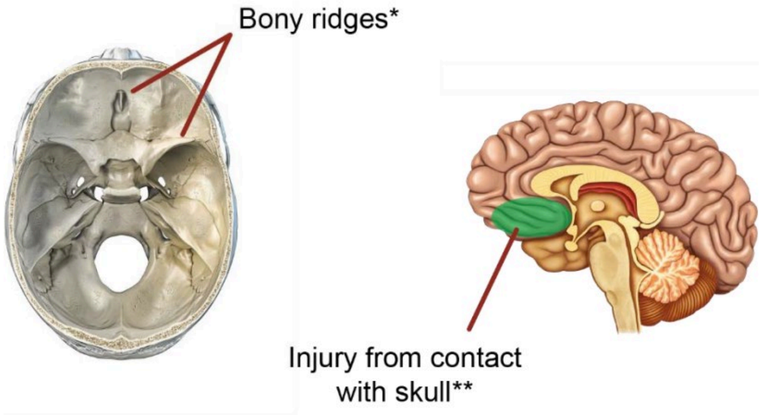
What Is a Traumatic Brain Injury (TBI)

- Disruption of brain function from an external force (e.g., blow, blast, jolt, penetration)
- Defined by DOD/VA as new/worsening of:
  - Loss/decreased level of consciousness or memory
  - Altered mental state (e.g., confusion)
  - Neurological deficits or intracranial lesion
  - Caused by external force — **not** stroke, anoxia, etc.

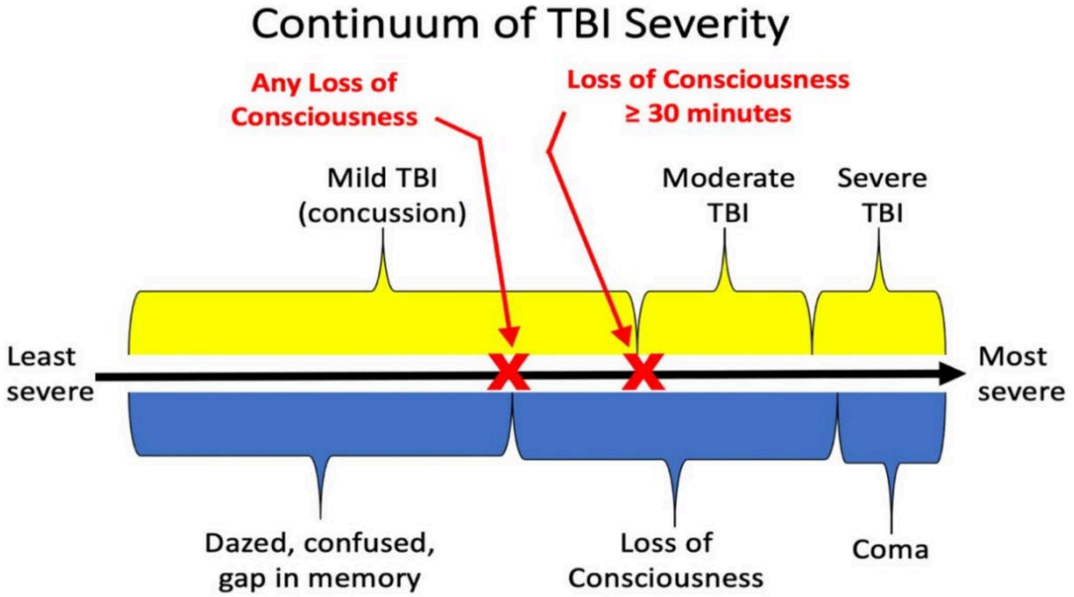


- **Frontal and anterior temporal lobes** commonly affected due to brain movement within the skull
- Frontal lobe damage disrupts executive function, emotional control, and behavior

What is the Classification of TBI?

- **Traditional Glasgow Coma Scale**
  - **Mild:** GCS 13–15 (≈75% of TBIs)
  - **Moderate**: GCS 9–12
  - **Severe**: GCS 3–8

- **CBI-M Framework** (Multidimensional)
  - Clinical
  - Imaging
  - Biomarkers
  - Modifiers



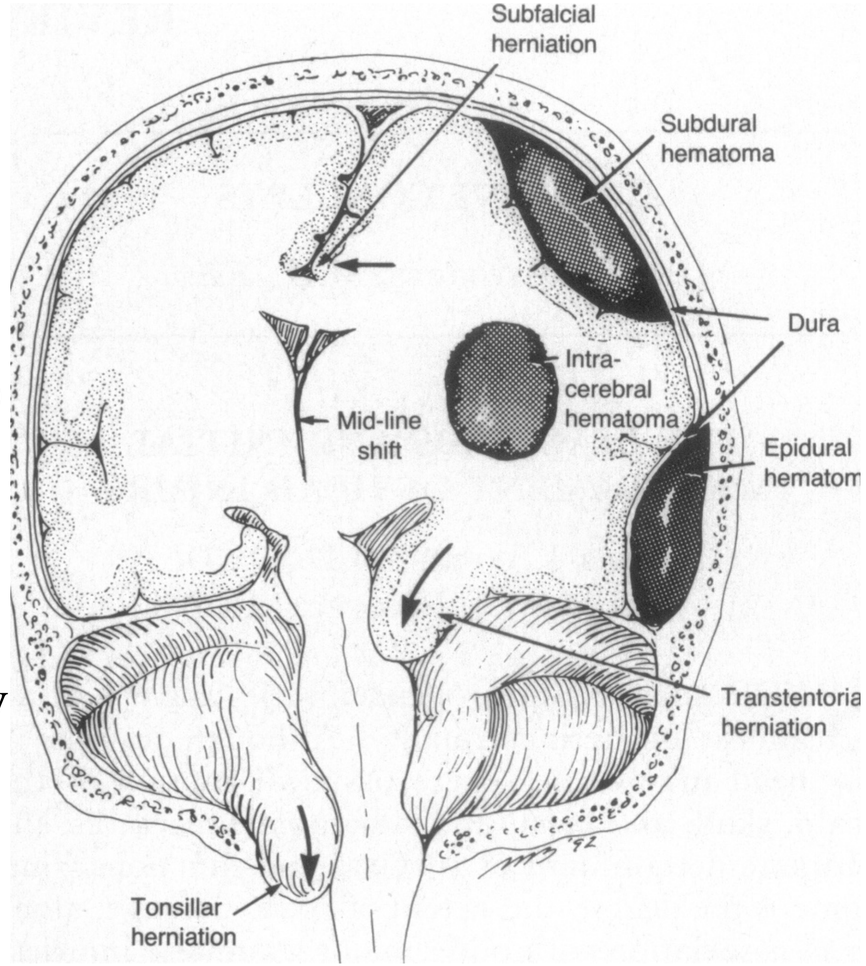
Severity index	Mild TBI/ concussion	Moderate TBI	Severe TBI
Neuroimaging findings	Normal structural imaging	Normal *or* abnormal structural imaging	Normal *or* abnormal structural imaging
Initial Glasgow Coma Scale	13-15	9-12	<9
Loss of consciousness (LOC)	0-30 min	>30 min and <24 h	>24 h
Length of alteration of consciousness (AOC)	A moment up to 24 h	AOC > 24 h (use other criteria)	
Length of posttraumatic amnesia (PTA)	0–1 d	>1 and <7 d	>7 d

Understanding the Injured brain
Definition and Spectrum of Traumatic Brain Injury

- **Includes a spectrum:**
  Mild (concussion) → Moderate → Severe
- **Most TBIs are mild**
  - ~80% are concussions
  - **Uncomplicated mild TBI:**
    - No intracranial injury on CT/MRI
  - **Complicated mild TBI:**
    - Mild TBI with the presence of traumatic intracranial findings (e.g., hemorrhage, contusions)
    - Outcomes resemble **moderate TBI**
- **Normal CT/MRI ≠ no brain injury**
  Many mild TBIs have normal imaging

Behavioral Changes associated with TBI

- **Orbitofrontal & anterior temporal lobes**
  - Impaired emotional control and social judgment
  - Impulsive aggression, poor decision-making
- **Diffuse Axonal Injury (Limbic-prefontal pathways)**
  - Worsening behavioral symptoms over time
- **Deep/subcortical structures**
  - Thalamic injury/Corpus callosum damage → anxiety
- **Network-level dysfunction:**
  - Impaired top-down regulation of the amygdala



Caption

Substance Use Disorders and Traumatic Brain Injuries

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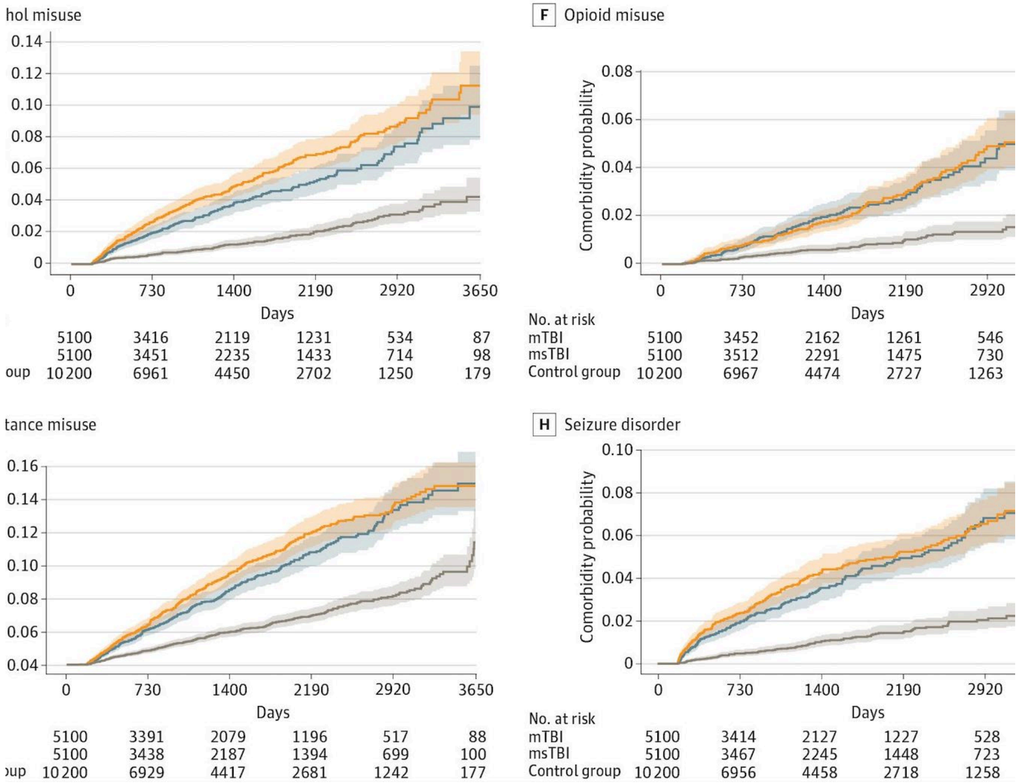
How Common is TBI in SUD Patients?

- **TBI history in SUD populations**:
  - **~48–80%;** Far higher than in the general population
- **Opioid Use Disorder (OUD):**
  - **~49%** report ≥1 TBI (In ~56% of cases, TBI was sustained before first opioid use)
- **Alcohol Use Disorder (AUD):**
  - Strong bidirectional relationship:
    - Alcohol intoxication increases TBI risk +TBI increases the risk/severity of AUD
    - **~30–40%** will be noted to have a mild neurocognitive disorder early in abstinence
- **Stimulants:** Limited prevalence data; TBI associated with more severe injuries and ↑ ICU use
- **Cannabis:** Prevalence unclear; comorbid TBI + CUD linked to higher cognitive disorder risk

TBI is a Risk Factor for SUD

- **Increased SUD risk after TBI**
  - Higher rates of alcohol, opioid, and other substance misuse
  - Risk persists up to 10 years
  - In OUD, **~56%** had TBI before first opioid use.
- **Higher risk in early-life TBI:**
  - Pediatric/adolescent injury disrupts developing reward circuits
  - Increases lifetime SUD vulnerability
- **Proposed mechanisms:**
  - Neuroinflammation and microglial priming
  - Altered reward and executive control networks



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Impact on Substance Use & Treatment

- **Impulsivity, poor judgment, altered reward processing**

  —>Increased vulnerability to substance use

- **Cognitive fatigue, mood instability, sleep problems**

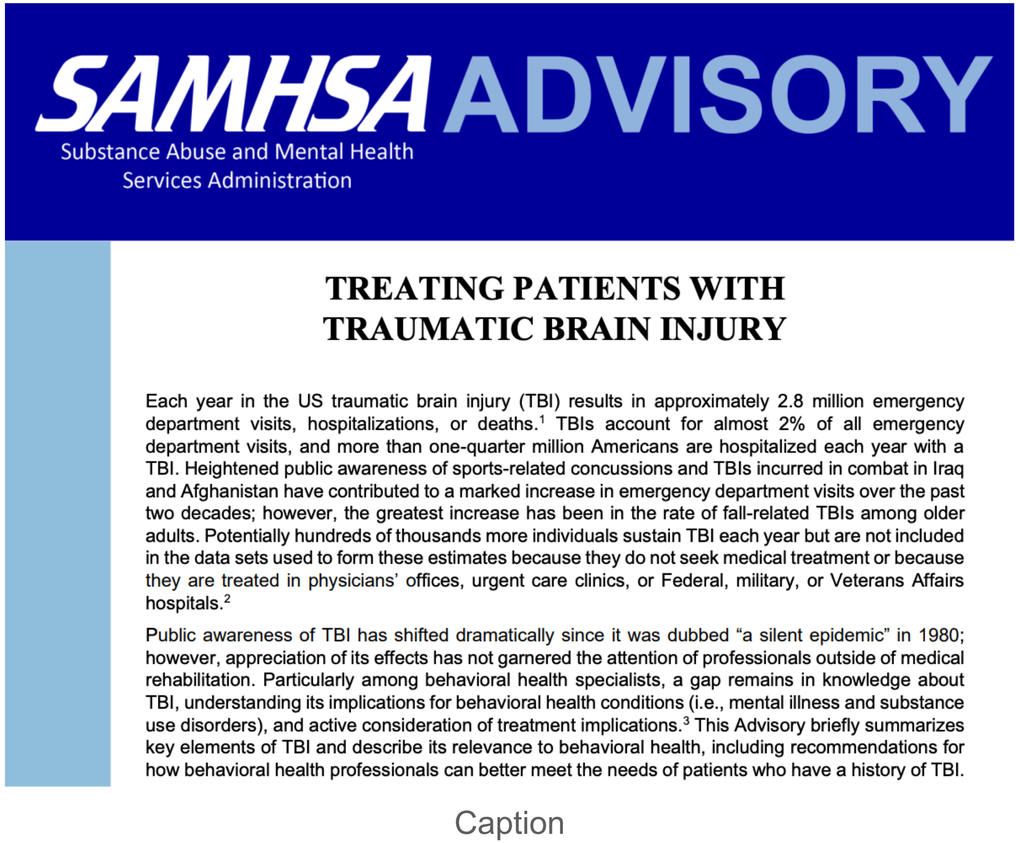
  —> Substances used to cope

- **Standard treatment assumes intact cognition**
  - TBI is associated with worse SUD treatment outcomes, higher drop-out, relapse, and “treatment failure”
  - Treatment planning must be adaptable with simpler goals, repetition, structure, external supports

SUD + TBI: Screening for TBI

SUD + TBI: Overview of Treatment

- **SAMHSA —Four essential strategies for behavioral health treatment:**
  - **Screening for a history of TBI**
  - Accommodations for executive function and neurobehavioral deficits
  - Holistic management of co-morbid conditions
  - Development of formal and informal supports during and after treatment



SAMHSA ADVISORY

Substance Abuse and Mental Health Services Administration

TREATING PATIENTS WITH TRAUMATIC BRAIN INJURY

Each year in the US traumatic brain injury (TBI) results in approximately 2.8 million emergency department visits, hospitalizations, or deaths.[1] TBIs account for almost 2% of all emergency department visits, and more than one-quarter million Americans are hospitalized each year with a TBI. Heightened public awareness of sports-related concussions and TBIs incurred in combat in Iraq and Afghanistan have contributed to a marked increase in emergency department visits over the past two decades; however, the greatest increase has been in the rate of fall-related TBIs among older adults. Potentially hundreds of thousands more individuals sustain TBI each year but are not included in the data sets used to form these estimates because they do not seek medical treatment or because they are treated in physicians' offices, urgent care clinics, or Federal, military, or Veterans Affairs hospitals.[2]

Public awareness of TBI has shifted dramatically since it was dubbed "a silent epidemic" in 1980; however, appreciation of its effects has not garnered the attention of professionals outside of medical rehabilitation. Particularly among behavioral health specialists, a gap remains in knowledge about TBI, understanding its implications for behavioral health conditions (i.e., mental illness and substance use disorders), and active consideration of treatment implications.[3] This Advisory briefly summarizes key elements of TBI and describe its relevance to behavioral health, including recommendations for how behavioral health professionals can better meet the needs of patients who have a history of TBI.

Caption

Screening for SUD in patients with TBI

- **SAMHSA recommends screening for lifetime exposure to TBI in patients presenting for SUD treatment**
  - **Ohio State University TBI Identification Method (OSU TBI-ID)**
    - Most widely used TBI screening tool
    - Takes 5–7 minutes
    - Can be administered by any trained staff
    - Free online training available
  - **Brain Check Survey**
    - Recommended for children and youth ages 5–21
    - Completed by a parent or guardian
    - Brain Check Survey website

Name: _____ Current Age: _____ Interviewer Initials: _____ Date: _____

Ohio State University TBI Identification Method — Interview Form

Step 1

Ask questions 1-5 below. Record the cause of each reported injury and any details provided spontaneously in the chart at the bottom of this page. You do not need to ask further about loss of consciousness or other injury details during this step.

I am going to ask you about injuries to your head or neck that you may have had anytime in your life.

1. In your lifetime, have you ever been hospitalized or treated in an emergency room following an injury to your head or neck? Think about any childhood injuries you remember or were told about.
   ☐ No ☐ Yes—Record cause in chart
2. In your lifetime, have you ever injured your head or neck in a car accident or from crashing some other moving vehicle like a bicycle, motorcycle or ATV?
   ☐ No ☐ Yes—Record cause in chart
3. In your lifetime, have you ever injured your head or neck in a fall or from being hit by something (for example, falling from a bike or horse, rollerblading, falling on ice, being hit by a rock)? Have you ever injured your head or neck playing sports or on the playground?
   ☐ No ☐ Yes—Record cause in chart
4. In your lifetime, have you ever injured your head or neck in a fight, from being hit by someone, or from being shaken violently? Have you ever been shot in the head?
   ☐ No ☐ Yes—Record cause in chart
5. In your lifetime, have you ever been nearby when an explosion or a blast occurred? If you served in the military, think about any combat- or training-related incidents.
   ☐ No ☐ Yes—Record cause in chart

Interviewer instruction:
If the answers to any of the above questions are "yes," go to Step 2. If the answers to all of the above questions are "no," then proceed to Step 3.

Step 2

Interviewer instruction: If the answer is "yes" to any of the questions in Step 1 ask the following additional questions about each reported injury and add details to the chart below.

Were you knocked out or did you lose consciousness (LOC)?

If yes, how long?

If no, were you dazed or did you have a gap in your memory from the injury?

How old were you?

Step 3

Interviewer instruction: Ask the following questions to help identify a history that may include multiple impacts to the head and complete the chart below.

Have you ever had a period of time in which you experienced multiple, repeated impacts to your head (e.g. history of abuse, contact sports, military duty)?

If yes, what was the typical or usual effect—were you knocked out (Loss of Consciousness - LOC)?

If no, were you dazed or did you have a gap in your memory from the injury?

What was the most severe effect from one of the times you had an impact to the head?

How old were you when these repeated injuries began? Ended?

Step 1	Step 2						
	Loss of consciousness (LOC)/knocked out				Dazed/Mem Gap		Age
Cause	No LOC	< 30 min	30 min-24 hrs	> 24 hrs	Yes	No	

If more injuries with LOC: How many?_____ Longest knocked out?_____ How many ≥ 30 mins.?_____ Youngest age? _____

Step 3	Typical Effect		Most Severe Effect				Age	
Cause of repeated injury	Dazed/ memory gap, no LOC	LOC	Dazed/ memory gap, no LOC	LOC < 30 min	LOC 30 min - 24 hrs.	LOC > 24 hrs.	Began	Ended

Caption

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Screening for Other Brain Injuries in SUD Populations

- **Hypoxic/anoxic brain injury commonly results from drug overdose**
  - Oxygen deprivation produces cognitive deficits similar to TBI, especially:
    - Executive dysfunction
    - Attention and memory impairment
    - Slowed processing and poor impulse control
- **Opioid overdose risk:**
  - Respiratory depression → cerebral hypoxia/anoxia
  - Often associated with worse neurologic outcomes than TBI
- **Clinical implication:**
  - Screening for TBI may also identify overdose-related brain injury
  - Same treatment accommodations are indicated

When to Refer to Neuropsychology

- **Indication:**
  - Persistent cognitive, behavioral, or emotional symptoms beyond expected recovery
  - Typically >1 month after mild TBI
- **Do not routinely refer in first 30 days after mild TBI**
  - Most cognitive deficits resolve within days–weeks
  - Early testing shows poor correlation with symptoms
- **Earlier referral may be appropriate with:**
  - Atypical features or prolonged symptoms
  - Significant pre-injury psychiatric history
  - Severe acute anxiety or depression

SUD + TBI:
Treatment Considerations

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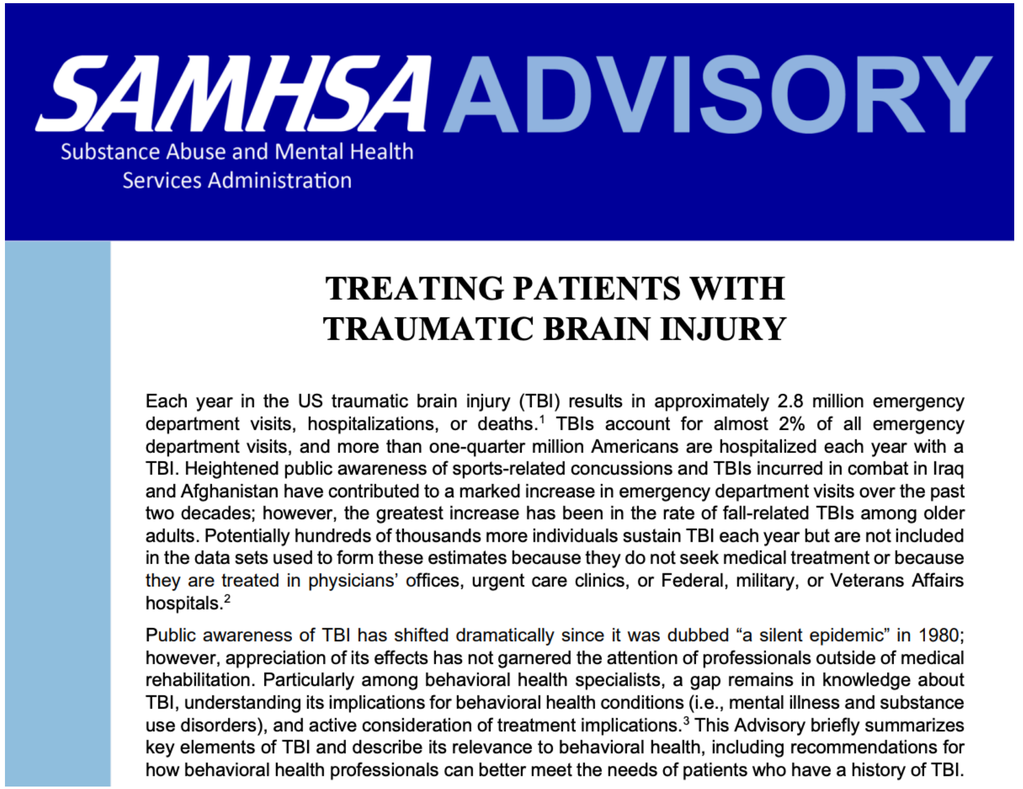
SUD + TBI: Overview of Treatment

- **SAMHSA—Four essential strategies for behavioral health treatment:**
  - Screening for a history of TBI
  - **Accommodations for executive function and neurobehavioral deficits**
  - Holistic management of co-morbid conditions
  - Development of formal and informal supports during and after treatment



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Caption

Treatment of SUD + TBI

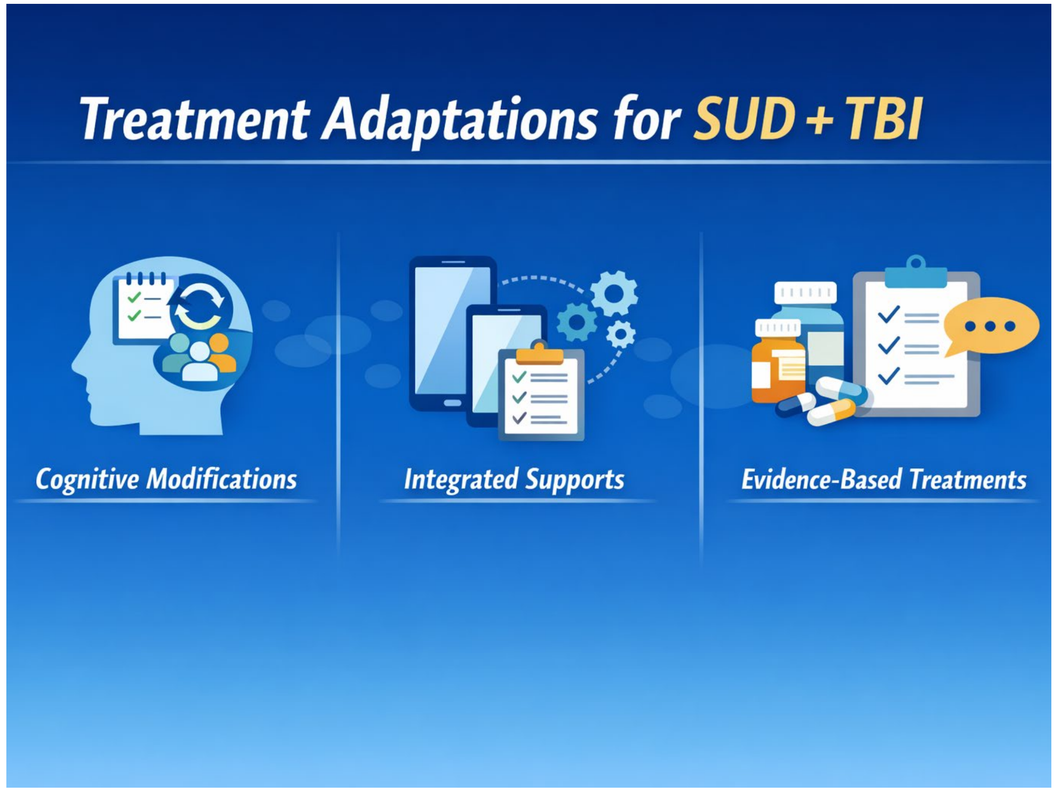
- **Limited evidence for *specific treatments* for SUD in individuals with TBI**
  - No specific therapeutic modality has been proven superior in this population
  - No evidence suggests that standard SUD treatments are ineffective in TBI patients
- **Clinical consensus supports adapting standard approaches to accommodate TBI-related deficits**
  - Key cognitive challenges to consider: attention, memory, and executive dysfunction
  - **Avoid misattributions (**may reflect cognitive deficits, not low motivation/engagement)
    - Missed appointments
    - Group dominance

Mismatch with Standard Care Models

- **Traditional care requires:**
  - Abstract reasoning
  - Complex information processing
  - Skill generalization across contexts
  - These exceed capacity for many patients with TBI
- **Psychosocial and coping challenges**
  - Executive dysfunction impairs adaptive coping
  - Difficulty managing boredom, stress, and social connections
  - Increases relapse risk
- **Clinical implication**
  - Standard SUD treatment is often insufficient
  - Brain-informed, adapted approaches are required

SUD Treatment Adaptations for SUD + TBI

- **Cognitive load awareness:**
  - **How much new learning is required (facts, rules, routines)?**
  - **How quickly is the material covered?**
    - Adjust the pace as needed to match processing speed
    - Keep sessions short and adjust pacing as needed
    - Match treatment demands to specific cognitive deficits
- **Attention and Memory Awareness:**
  - **How is the material presented?**
    - Present information in small, repeated chunks
    - Use reminders and visual aids
    - Reinforce oral information with written materials
    - Use familiar assistive technologies (smartphones, tablets)
  - **What is the environment?**
    - Reduce distractions
    - Use smaller groups



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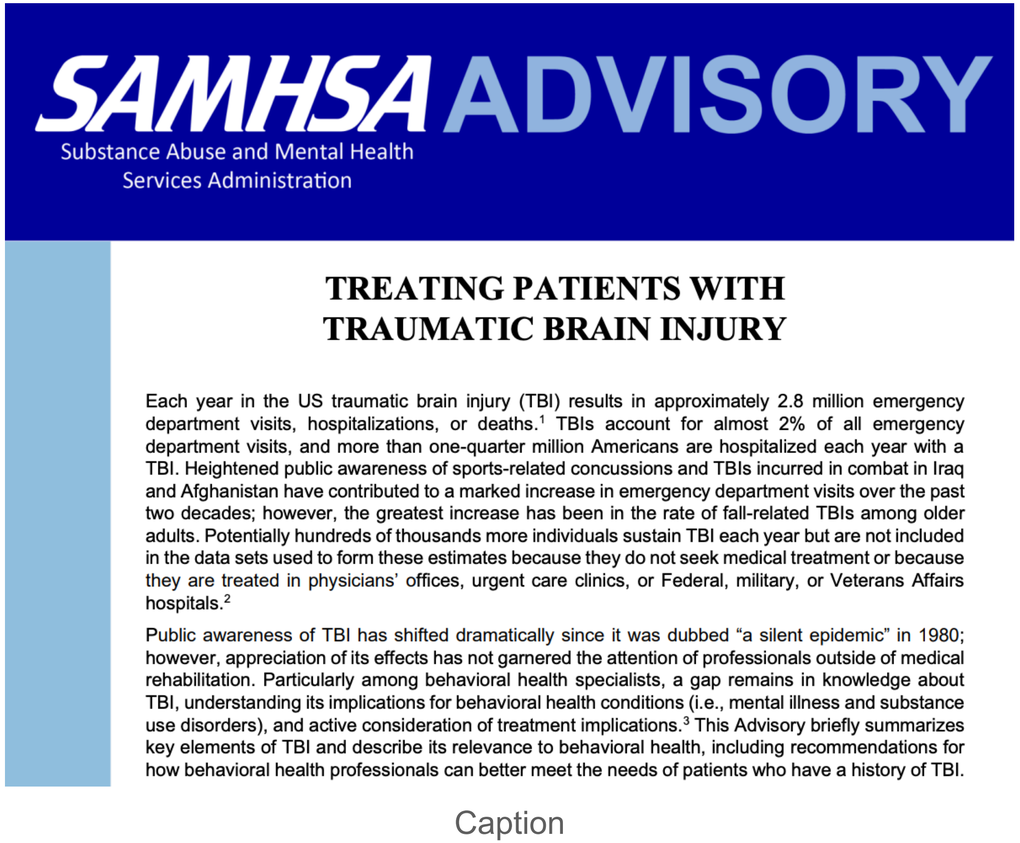

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Caption

Holistic Management of Co-Morbid Conditions

- **Cognitive impairment**
  - Deficits in attention, memory, and executive function
  - Overlapping effects of TBI and substance use
- **Psychiatric disorders**
  - High prevalence of depression, anxiety, PTSD, suicidality
  - Risks persist for years after TBI
- **Pain and sleep disorders**
  - Chronic pain is common and in TBI/SUD and may significantly worsen SUD outcomes.
  - Sleep disorders are common and clinically consequential in TBI + SUD, affecting up to 70% post-TBI and increasing cognitive impairment, mood symptoms, and relapse risk; routine screening is essential.

Holistic Management of Co-Morbid Conditions

- **Cognitive rehabilitation**
- **Psychiatric disorders**
  - Use validated tools to screen for common co-occurring conditions (depression, anxiety, and PTSD)
  - Treat co-occurring conditions concurrently, integrating evidence-based psychotherapy and pharmacotherapy.
- **Chronic pain**
  - **First-line treatment should be nonpharmacologic** and multimodal, including CBT-, acceptance-, and mindfulness-based approaches and collaborative care models adapted for TBI-related cognitive deficits.
  - **Avoid opioids when possible**; prioritize nonopioid strategies and, when OUD is present, use buprenorphine or methadone to address both pain and SUD, with coordinated, co-occurring–capable care.
- **Sleep Disorders**
  - **CBT-I is first-line treatment**, with strong evidence in both TBI and SUD
  - **Use medications sparingly and cautiously**: avoid benzodiazepines and sedative-hypnotics

Cognitive Rehabilitation

- **Best available treatment for cognitive impairment post-TBI**
- **Targets attention, memory, executive function, social skills** – *overlaps with SUD deficits*
- **Attention training** (ACRM-recommended): direct + adjunctive training; focus on real-world application
- **Memory strategies**:
  - Mnemonics, encoding techniques, external aids
  - Drill-based methods are less effective
- **Executive function rehab**:
  - **Goal Management Training (GMT)** – break tasks into steps
  - **Attention & Problem Solving (APS)** – group-based progression
  - **GOALS Program** – attention → real-life goals + stress regulation

SUD + TBI: Overview of Treatment

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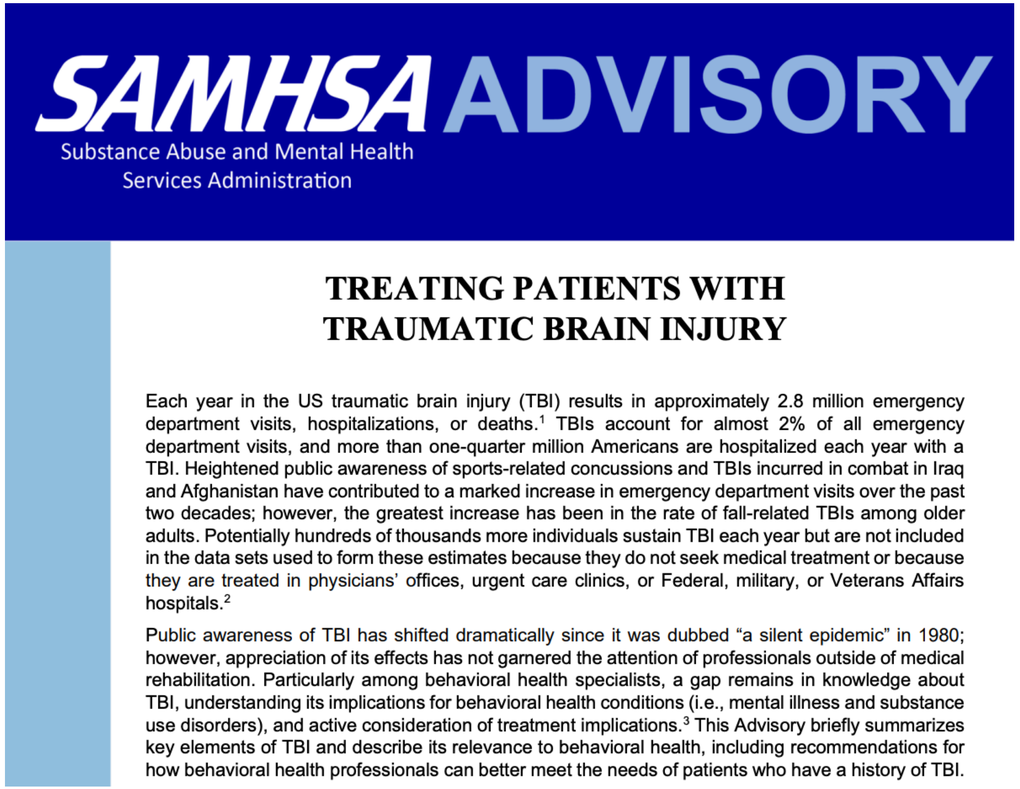
  - **Development of formal and informal supports during and after treatment**



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Caption

Formal and Informal Supports

- **Insight alone is often insufficient after TBI:** Executive function deficits impair follow-through and self-regulation
- **External supports are essential during treatment:** Should be developed early, not postponed to discharge
- **The treatment environment matters:** Social and physical contexts can support or undermine recovery
- **Long-term natural supports are critical:** Family, peers, recovery groups, and structured routines
- **Sustaining change takes more time after TBI:** Ongoing support helps consolidate gains and prevent relapse

SUD + TBI:
Evidence Based Pharmacotherapy

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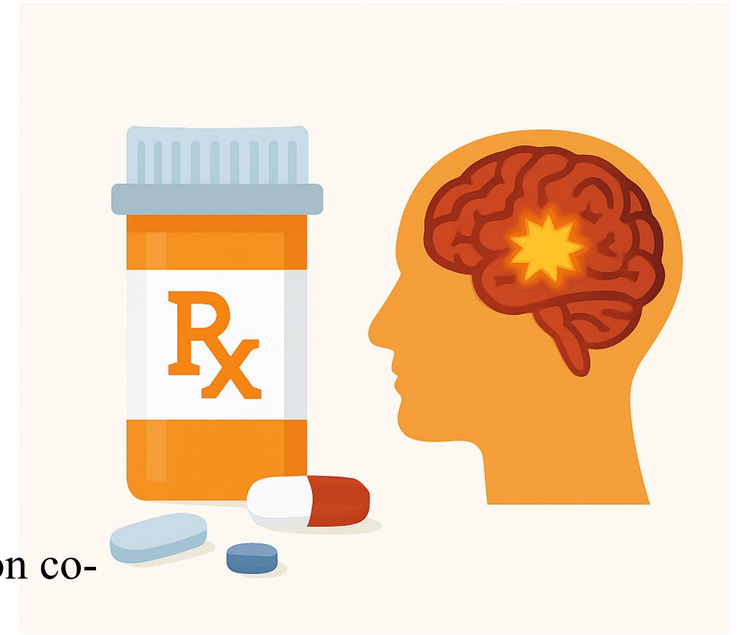
Pharmacotherapy: SUD in TBI patients

- **Very limited evidence** to guide SUD pharmacotherapy in individuals with TBI
  - Most data comes from **SUD medications** used in non-TBI populations
- **Alcohol Use Disorder**
  - **FDA-approved AUD meds** (disulfiram, acamprosate, naltrexone, XR-NTX):
    - None have been studied specifically in individuals with both AUD and TBI
  - **Valproate (Limited evidence; mixed results)**
    - Small RCT (N=62) compared valproate to naltrexone in veterans with AUD and common co-occurring conditions
      - 60% of patients with TBI and this subgroup was more likely to return to heavy drinking
      - Valproate appeared to be less effective than naltrexone (not statistically significant)
    - Small open label trial of valproic acid in patient with AUD and TBI suggested a reduction in alcohol use and improved mood symptoms



Pharmacotherapy: SUD in TBI patients

- **Topiramate**:
  - Evidence-based AUD treatment (off-label)
  - May also be beneficial in chronic post-traumatic headache
  - Only prospective RCT in AUD + mTBI (32 veterans)
    - Decreased alcohol use significantly vs. placebo
    - Cognitive side effects while in treatment (verbal memory, learning)
- **Other SUDs (opioids, stimulants, sedatives, cannabis):**
  - No clinical trials specifically in SUD + TBI populations
- **No current pharmacotherapy is contraindicated for TBI, but efficacy is unproven**

Repurposing SUD Medications for TBI

- Limited evidence for **naltrexone** to treat TBI-related symptoms in individuals without SUD
  - Based on animal research suggesting **opioid antagonists** may reduce effects of acute brain injury
  - Two published reports
    - Naltrexone appeared to improve post-concussive symptoms
    - Naltrexone associated with accelerated improvement in functional status in a single patient
  - Should be considered investigational

Neuromodulation

- **Transcranial Magnetic Stimulation**
  - Noninvasive brain stimulation using magnetic pulses
  - FDA-approved indications: Depression, chronic migraine, OCD, smoking cessation, anxious depression
- **Potential treatment in TBI populations —** Emerging evidence suggest an improvement in cognition
- **TMS and SUD treatment**
  - **FDA-cleared for tobacco use disorder** (2020, Brainsway H4 coil)
    - Significantly improved quit rates
    - Meta-analysis: 139% ↑ abstinence at 3–6 months vs. placebo
  - **Unclear efficacy with other SUDs** (alcohol, cocaine, opioids, etc.)
    - Mixed results; heterogenous treatment outcomes
- **Promising for TBI + SUD**
  - Cognitive benefits could improve executive function and efficacy of traditional SUD treatment
  - Direct efficacy targeting SUD
- **Safety considerations** in TBI/SUD population

Key Points

- TBI and SUDs co-occur commonly, but are often unrecognized.
- SAMHSA recommends screening ALL patients with SUD for TBI.
- Treatment for SUD is effective in patients with TBI, but accommodations are often required for success.

References and Further Reading

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