Strategies for the Management of TBI-Related Behavioral Health Sequelae

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Mountain Plains (HHS Region 8)

MHTTC Mental Health Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

NATIONAL ASSOCIATION OF STATE HEAD INJURY ADMINISTRATORS

UNIVERSITY of DENVER

SAMHSA

Substance Abuse and Mental Health Services Administration

Disclaimer

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At the time of this presentation, Elinore F. McCance-Katz served as SAMHSA Assistant Secretary. The opinions expressed herein are the views of Kim Gorgens, and do not reflect the official position of the Department of Health and Human Services (DHHS), or SAMHSA. No official support or endorsement of DHHS, SAMHSA, for the opinions described in this presentation is intended or should be inferred.

Mountain Plains Mental Health Technology Transfer Center

The Mountain Plains Mental Health Technology Transfer Center provides training and technical assistance on evidence-based practices to the mental health providers of Region 8 (Colorado, Montana, North Dakota, South Dakota, and Utah).

We belong to the Technology Transfer Center (TTC) Network, a national network of training and technical assistance centers serving the needs of mental health, substance use and prevention providers. The work of the TTC Network is under a cooperative agreement by the Substance Abuse and Mental Health Service Administration (SAMHSA).

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Disclosure

I have no actual or potential conflict of interest in relation to this presentation.

Research and funding support from:
Colorado Brain Injury Program (MINDSOURCE), Vista Lifesciences, The Barton Institute for Philanthropy and Social Enterprise, and a TBI Implementation Grant to Colorado Brain Injury Program, Funded by TBI Implementation Grant #H21MC17232 from the U.S. Department of Health and Human Services, Administration on Community Living (ACL).

The view expressed here are the responsibility of the author and do not necessarily represent the official views of the University of Denver or the Colorado Brain Injury Program.

TBI Complications: The Highest Stakes

25% - 97% of justice-involved

48% of homeless

60% have substance abuse

60% have mental illness

Mental Health Fallout

- Almost half of adults with TBI who have no pre-injury history of mental health problems develop mental health problems within 1 year of the TBI
  - 18–61% for depression, 1–22% for mania, 3–59% for posttraumatic stress disorder, 20–40% for post-traumatic aggression, 8% panic disorder, 8% specific phobia, and 6% psychotic disorders
    - **(Kim et al., 2007)**
  - 23% had at least one personality disorder (avoidant 15%, paranoid 8%, and schizoid 6%)
    - **(Gould, Ponsford, Johnston, & Schonberger, 2011; Koponen at al., 2002)**
- 1/3 of TBI survivors experience emotional problems between 6 months and a year post injury
    - Hopelessness 35%, Suicidal ideation 23%, Suicide attempts 18%
- Suicidal ideation is 7x higher in people with TBI than in those without
  - *Attempts* of suicide post-TBI=17%
  - Increased suicide risk persists up to 15 years post-injury
    - **(Fazel, et al., 2014; National Suicide Prevention Lifeline 800-273-TALK (8255)**
    - Confidential Veterans Crisis Line at 1-800-273-8255 (1-800-273-TALK) or text to #838255
- 85% of survivor families report that emotional or behavioral problems have an impact on their function

Substance Abuse Risks

1. Intoxication can cause TBI
2. Early life TBI predispose to substance abuse
3. Structural damage from TBI changes behavioral control

Mortality Risk

- 3.5 million individuals in the U.S. are disabled due to the myriad sequelae of TBI
  - **(Zaloshnja et al., 2008)**
- Reduced life expectancy (~ 7 years)
  - **(Harrison-Felix et al., 2004; Harrison-Felix et al., 2009)**
- Compare to non-injured general population matched for age, race, and gender
  - 49 times more likely to die of aspiration pneumonia
  - 22 times more likely to die of seizures
  - 3 times more likely to die of suicide
    - **National Suicide Prevention Lifeline 800-273-TALK (8255)**
    - Confidential Veterans Crisis Line at 1-800-273-8255 (1-800-273-TALK) or text to #838255
- 7x increased risk of death overall within 15 months of discharge
  - **(Selassie et al., 2005)**

Suicide Risk in Veteran Populations

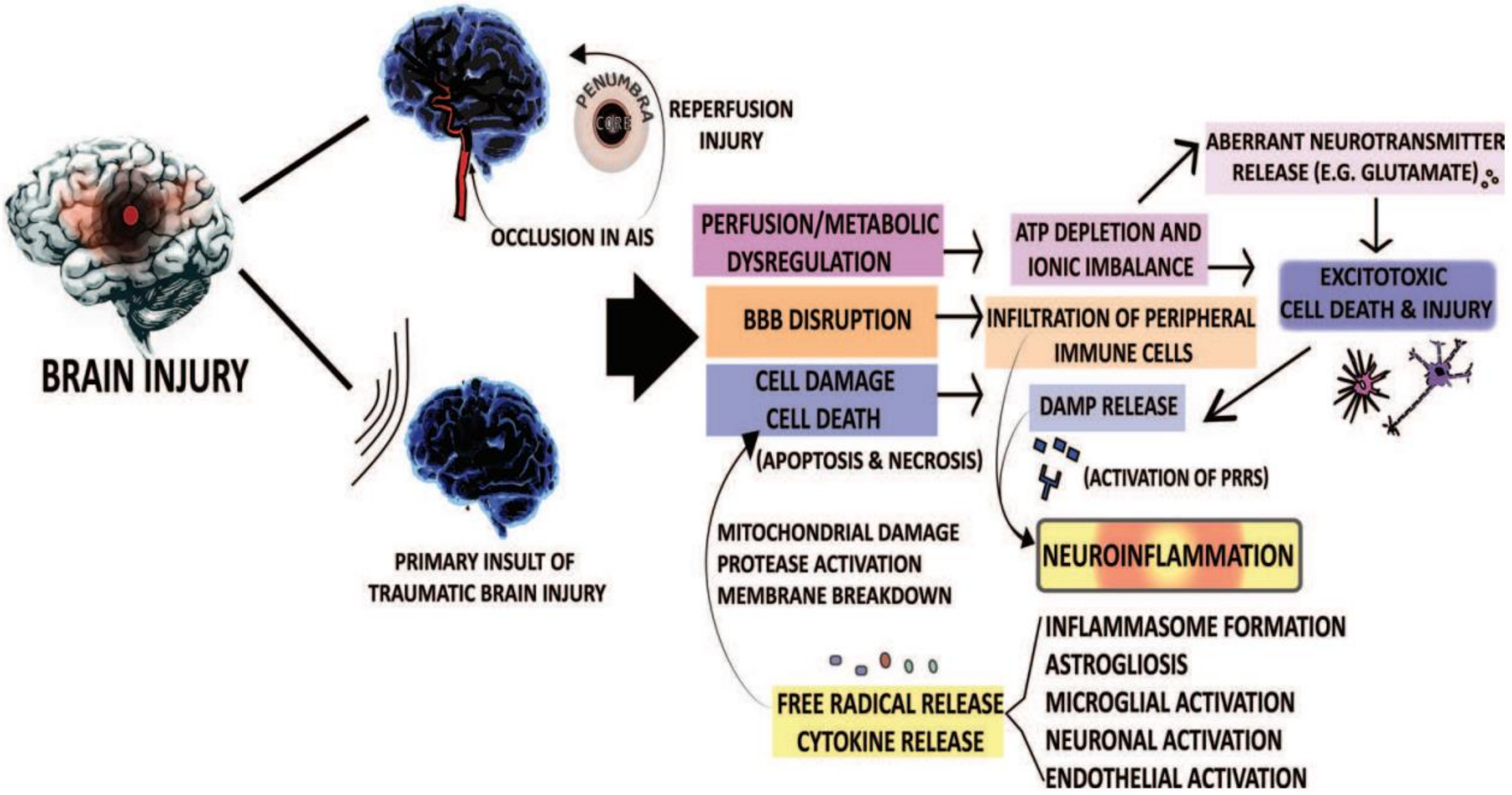
- Most recent CDC Data (November 2018) suggest that suicide rates are on the rise
- Suicide rates are rising in some subgroups; specifically, for Veterans ages 18–34, suicide rates have increased substantially since 2005
  - "Average 20 suicide deaths per day among all current and former service members"
  - The unadjusted **Veteran** suicide rate increased from 29.8/100,000 in 2016 to 31.0/100,000 in 2017
- Confidential Veterans Crisis Line at 1-800-273-8255 (1-800-273-TALK) or text to #838255
  - Staffed by mental health professionals 24 hours a day, seven days a week

Other Health Risks

- Significant atrophy of the hippocampus
- Epilepsy
- Sleep problems
  - Obstructive Sleep Apnea
- Neurodegenerative Disease
- Neuroendocrine disorders (e.g. post-traumatic hypopituitarism)

Neurobiological Changes

- **Blood Brain Barrier (BBB) dysfunction**
  - Immediate disruption due mechanical damage
  - Chronical disruption due to inflammation
- **Abnormal neuro-metabolic processes**
  - “neuro-metabolic cascade” includes hypermetabolic state followed by a hypo-metabolic
- **Abnormal neuro-inflammatory processes**
  - After repeated impacts=increased pro-inflammatory and decreased anti-inflammatory cytokine levels
- **Tau aggregation**
  - Chronic Traumatic Encephalopathy (CTE)


BRAIN INJURY
PENUMBRA
CORE
REPERFUSION INJURY
OCCLUSION IN AIS
PRIMARY INSULT OF TRAUMATIC BRAIN INJURY
PERFUSION/METABOLIC DYSREGULATION
BBB DISRUPTION
CELL DAMAGE CELL DEATH
(APOPTOSIS & NECROSIS)
MITOCHONDRIAL DAMAGE
PROTEASE ACTIVATION
MEMBRANE BREAKDOWN
FREE RADICAL RELEASE
CYTOKINE RELEASE
ATP DEPLETION AND IONIC IMBALANCE
ABERRANT NEUROTRANSMITTER RELEASE (E.G. GLUTAMATE)
EXCITOTOXIC CELL DEATH & INJURY
INFILTRATION OF PERIPHERAL IMMUNE CELLS
DAMP RELEASE
(ACTIVATION OF PRRS)
NEUROINFLAMMATION
INFLAMMASOME FORMATION
ASTROGLIOSIS
MICROGLIAL ACTIVATION
NEURONAL ACTIVATION
ENDOTHELIAL ACTIVATION

What Will that Look Like?

Sequelae of Brain Injury

Physical & Medical	Cognitive	Emotional/Behavioral
Balance	Information processing	Depression
Fine and gross motor skills	Orientation to person, place and time	Anxiety
Range of motion/flexibility	Sequencing	Aggression
Coordination	Problem-solving and judgment	Flat or restricted affect
Spasticity (stiffness) and ataxia (shakiness)	Memory	Mood swings
Pain, particularly headache	Planning and organizing	Emotional lability
Changes in or loss of senses	Attention/concentration	Social skills
Seizure disorder	Communication problems (word-finding, understanding others, staying on topic)	Disinhibition
Hastened aging process	Flexible thinking	Apathy
Quality of speech and swallowing issues	Being able to initiate or start things	Exaggerated personality
Endurance		Changes in drives (hunger, sex, and temper)
Sleep disturbance		Impulsivity

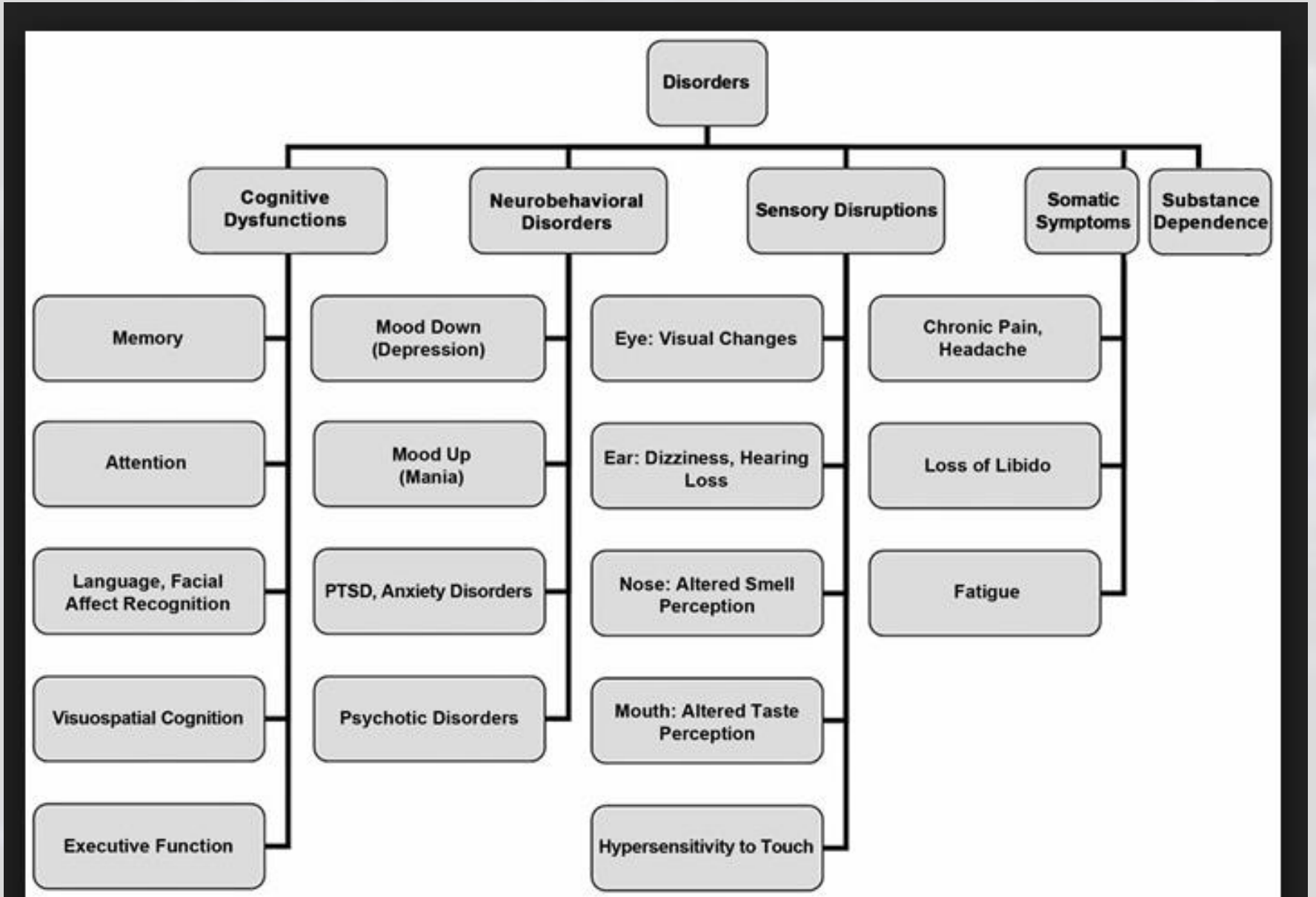


Figure 1.
Clusters of neuropsychiatric symptoms of traumatic brain injury. PTSD = posttraumatic stress disorder.

From:
Department of Veteran's Affairs (2015)

Clinical Secret

The BIG THREE

Post-Traumatic Headaches (PTH or PTHA)

- **Chronic** post-traumatic headache=12+ months after injury
  - Rates reach up to 95%
    - 71% after moderate/severe TBI and 91% after mild TBI (mTBI) at 1 year **(Lucas, 2015)**
    - 61% daily headaches, 39% migraine (26% had new onset of a migraine-like disorder) and 9% tension-type headaches **(Kuczynski, Crawford, Bodell, Dewey, & Barlow, 2013)**
    - The report of chronic pain is often inversely correlated with severity of injury

Why and How

- Existing vulnerability
- Cervicogenic
- Neuro-inflammation
  - "*Inflammatory-evoked enhancement of peripheral cranial nociception, rather than changes in supraspinal pain mechanisms play a role in the initial emergence of PTH*"
    - (Benromano, Defrin, Ahn, Zhao, Pick & Levy, 2014)
- Damaged pain pathways?
  - "*Damage to pain modulatory systems along with chronic cranial sensitization underlies the development of CPTHA*"
    - (Defrin, Riabinin, Feingold, Schreiber, & Chaim, 2015)
- Estrogen disruption?
  - (Fortress, Avcu, Wagner, Dixon, & Pang, 2019)
- Psychology
  - Conditioned pain avoidance, stress

Headache

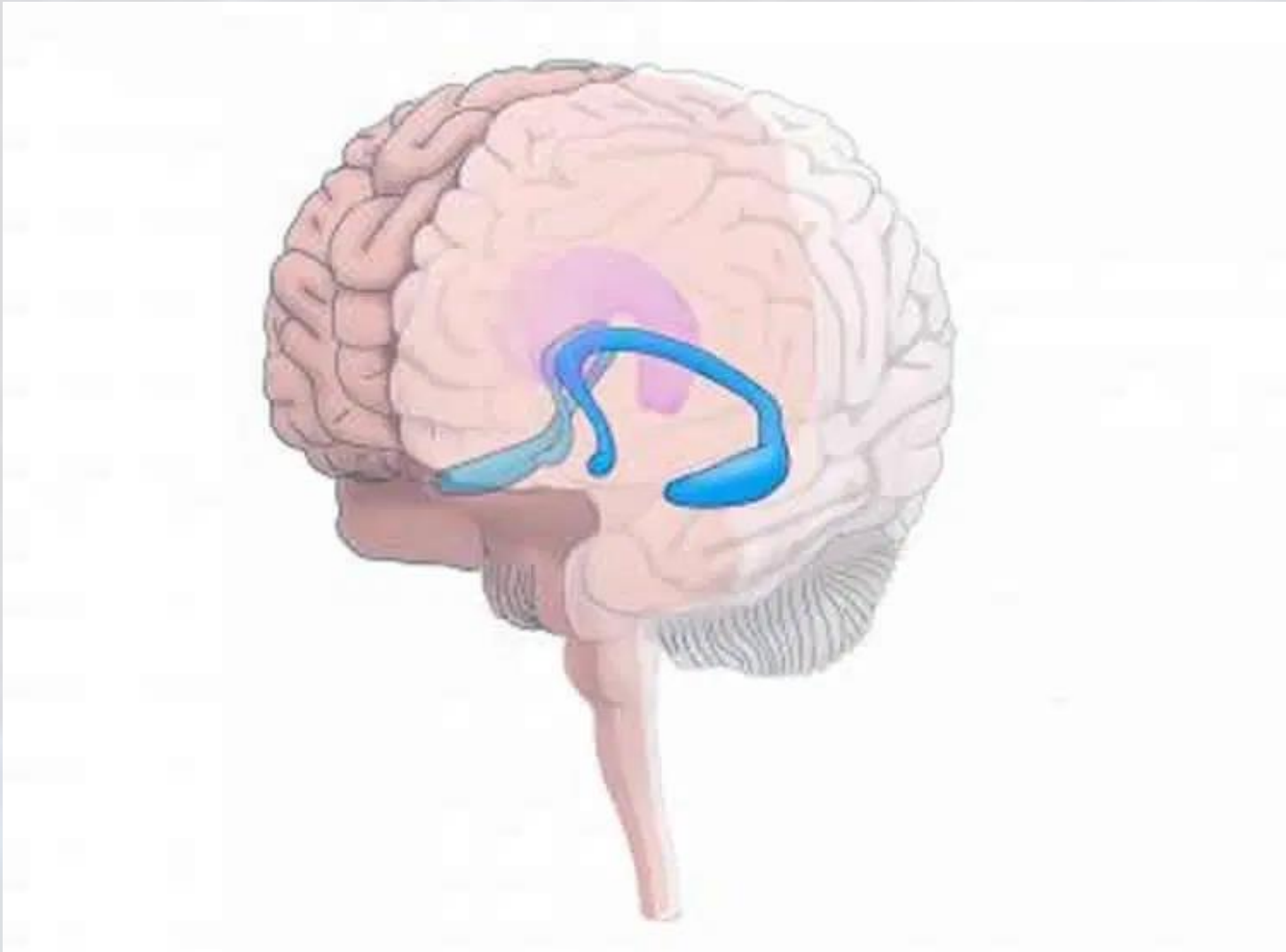
- There are no evidence-based treatment guidelines for PTH management
  - (Moye & Pradhan, 2017; *The Journal of Headache and Pain,* 11/2019)
- Cognitive Behavioral Therapy (CBT)
- Relaxation techniques
- Medication
  - Antidepressant, antiepileptics, triptans, OTC options
  - 15% develop MEDICATION OVERUSE HEADACHE (MOH)
    - "Central sensitization that produces increased pain responsivity in both cephalic and peripheral regions"
- Physical Therapy (e.g. neck strengthening)
- Aerobic exercise
  - 60 seconds at a time
  - Promotes neurogenesis
  - See activity prescription next slide
- New horizons
  - Cranial-nerve Non-invasive Neuromodulation (CN-NINM)
  - DOR agonists (also in clinical trials for anxiety and depression; Moye, Tipton, Dripps, Sheets, Crombie, Violin, & Pradhan, 2019)
  - Clinicaltrials.gov

Mood Disturbance

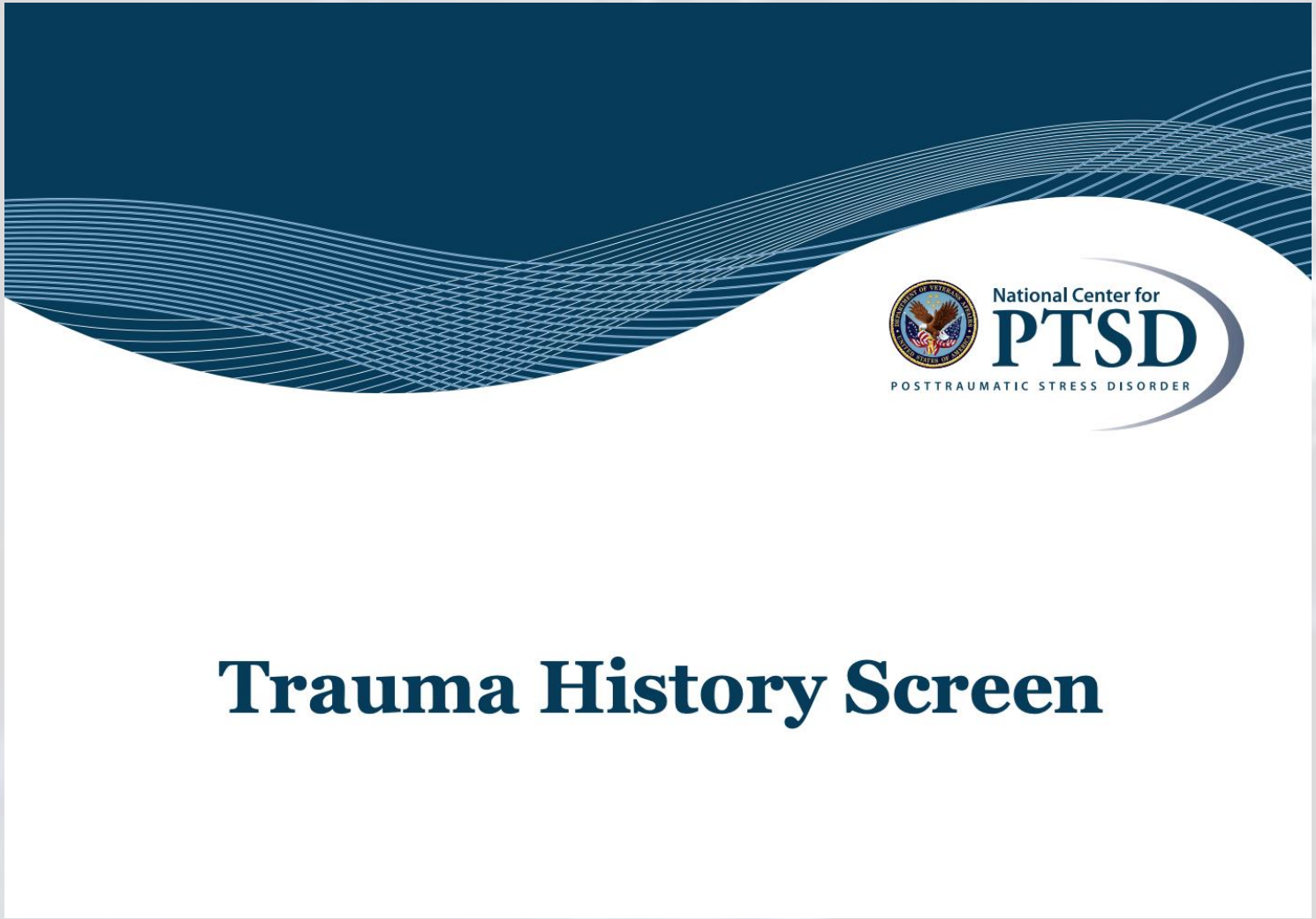
- Anxiety and depression have the greatest impact than cognitive impairment on social and occupational functioning following brain injury (Bertisch et al., 2013)
- 37%-50% of people report clinically significant levels of anxiety following TBI (Osborn, Mathias, & Fairweather-Schmidt, 2015)
  - Post-traumatic stress disorder, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, specific phobia, and social anxiety disorder (Sasha, Sutherland, Syb, Mainland, & Ornstein, 2015)
- Suicidal ideation reported in more than 80% of persons after TBI
  - 4 times more likely to die “intentionally”
    - (Varaamo, Jussi, Sami, Seppo, & Matti, 2015)

Why and How

- Hippocampal volume loss and neuroinflammation
  - "Understanding trauma-induced hippocampal subfield volume changes in the context of age and health" (2020)
- Glial cell pathology
  - Two pathways of astrogliopathology: reactive astrogliosis where astrocytes can have anisomorphic/severe scar forming effects or astrocytopathy, that includes the atrophy/degeneration, with loss of function and pathological remodeling of astrocytes
    - See **Kim, Healey, Sepulveda-Orengo, & Reissner (2018). Astroglial correlates of neuropsychiatric disease: From astrocytopathy to astrogliosis.** ***Progress in Neuropsychopharmacology & Biological Psychiatry, 87*****, 126-146.**
- White matter abnormalities
  - "*..anxiety was associated with more restricted diffusion and greater anisotropy in regions of crossing/diverging fibers*"
    - (Davenport, Lim, & Sponheim, 2015)
- Pituitary dysfunction
  - Growth hormone (GH) is the most common hormone lost after TBI, followed by ACTH, gonadotropins (FSH and LH), and TSH
    - (Tanriverdi, Schneider, Aimaretti, Masel, Casanueva, & Kelestimur, 2015)
  - Growth hormone deficiency has adverse effects on executive abilities and mood=anxiety
    - (Ioachimescu, Hampstead, Moore, Burgess, & Phillips, 2015)
- Psychology
  - Expectancies, role changes, subjective vs. objective deficits, relationship changes
- Premorbid psychopathology/existing vulnerability

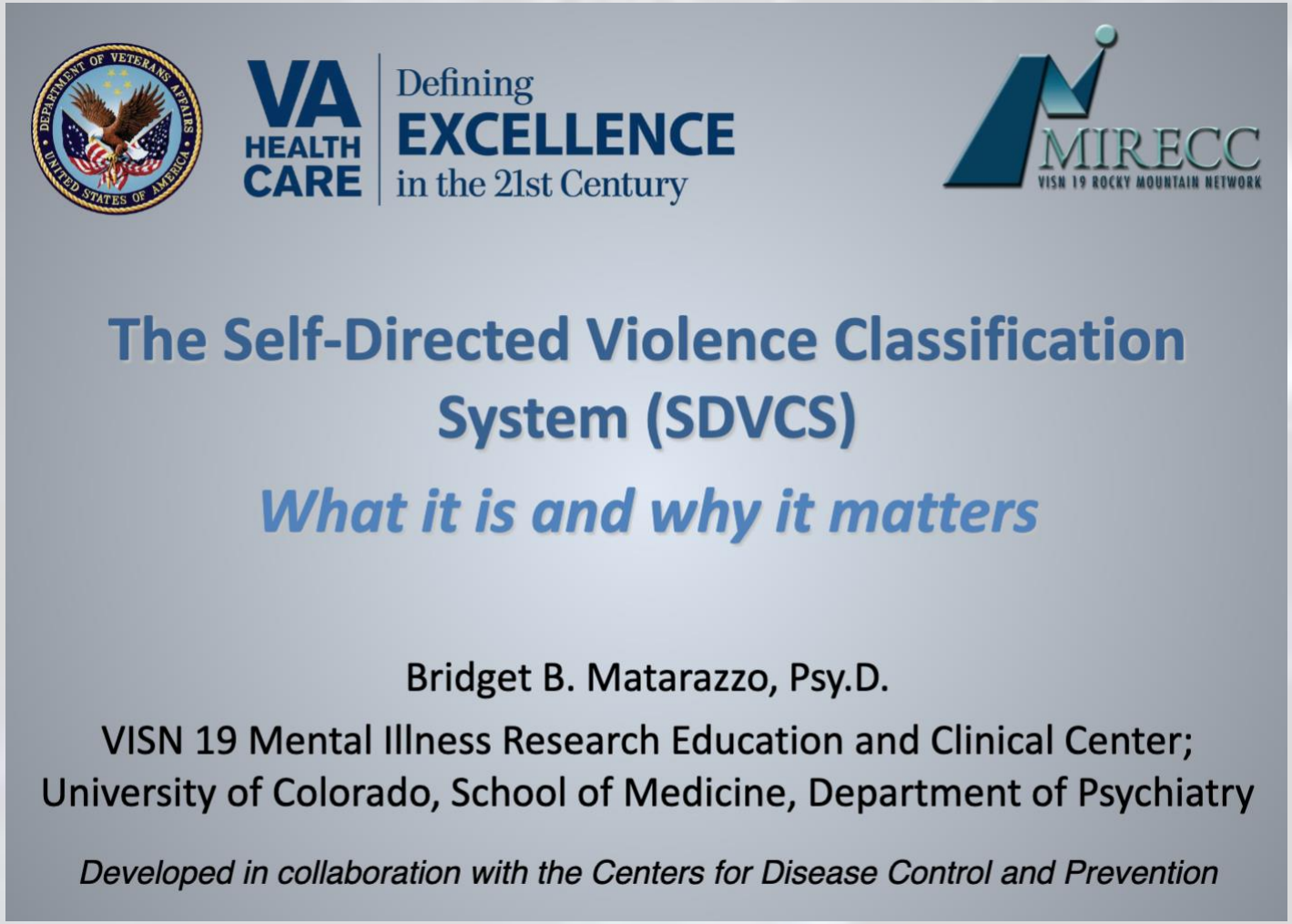


Trauma History



https://www.ptsd.va.gov/professional/assessment/documents/THS.pdf

Risk for Self-Harm/Suicide Risk



https://www.mirecc.va.gov/visn19/docs/presentations/SDVCS_Master_Training.pdf

Self-Directed Violence (SDV) Classification System
Clinical Tool

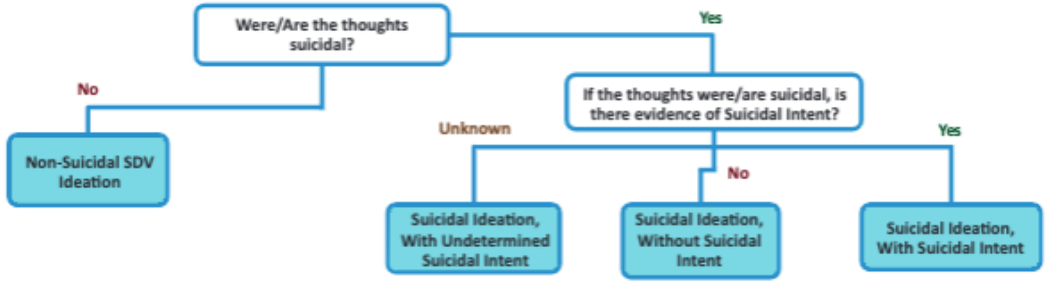
BEGIN WITH THESE 3 QUESTIONS:

1. Is there any indication that the person engaged in self-directed violent behavior that was lethal, preparatory, or potentially harmful? (Refer to Key Terms on reverse side)
   If NO, proceed to Question 2
   If YES, proceed to Question 3

2. Is there any indication that the person had self-directed violence related thoughts?
   If NO to Questions 1 and 2, there is insufficient evidence to suggest self-directed violence →NO SDV TERM
   If YES, proceed to Decision Tree A

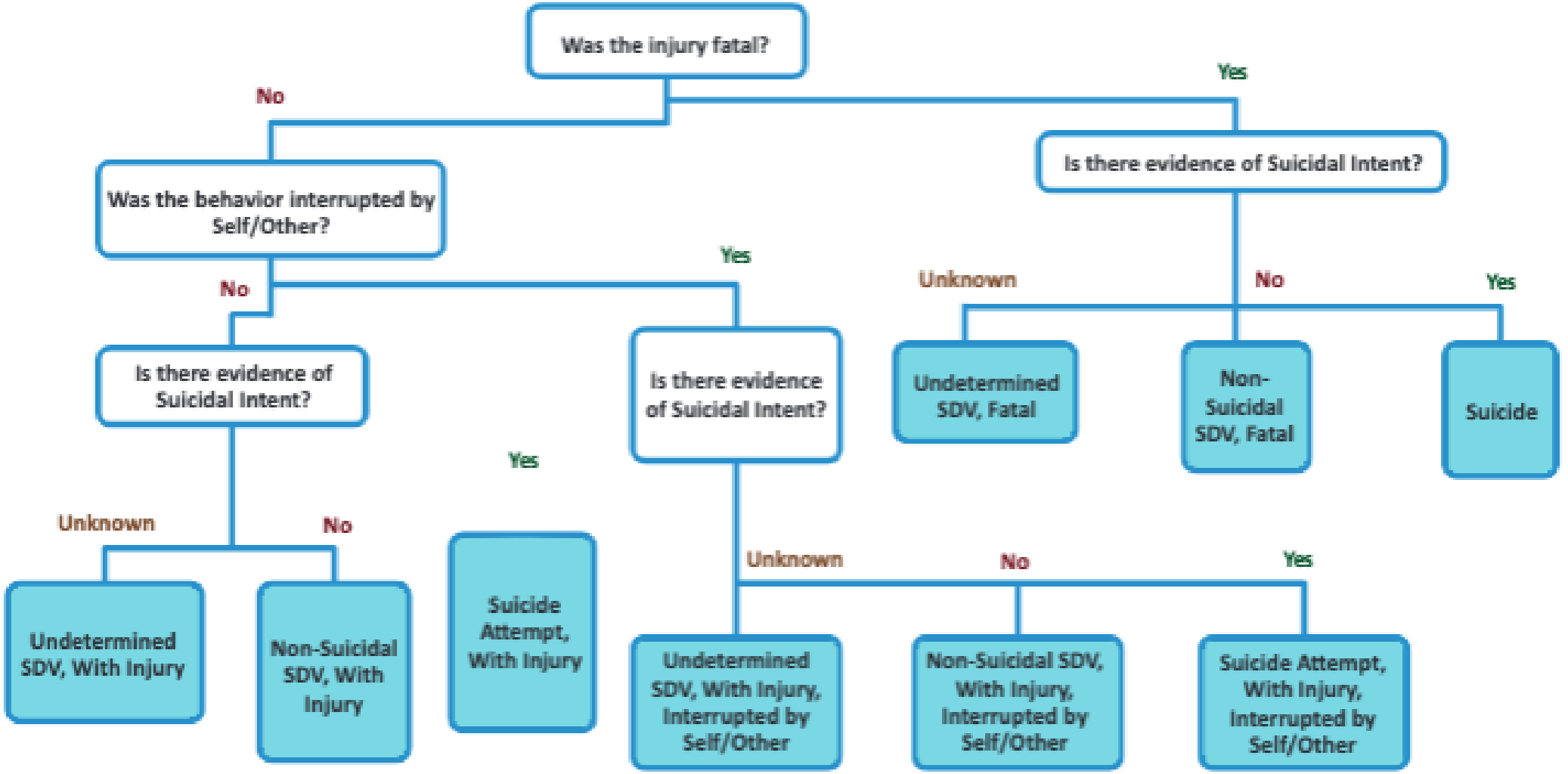
3. Did the behavior involve any injury or did it result in death?
   If NO, proceed to Decision Tree B
   If YES, proceed to Decision Tree C

DECISION TREE A: THOUGHTS



DECISION TREE B: BEHAVIORS, WITHOUT INJURY

DECISION TREE C: BEHAVIORS, WITH INJURY



Self-Directed Violence (SDV) Classification System
Clinical Tool

Key Terms (Centers for Disease Control and Prevention)

Self-Directed Violence:	Behavior that is self-directed and deliberately results in injury or the potential for injury to oneself.
Suicidal Intent:	There is past or present evidence (implicit or explicit) that an individual wishes to die, means to kill him/herself, and understands the probable consequences of his/her actions or potential actions. Suicidal intent can be determined retrospectively and in the absence of suicidal behavior.
Preparatory Behavior:	Acts or preparation towards engaging in Self-Directed Violence, but before potential for injury has begun. This can include anything beyond a verbalization or thought, such as assembling a method (e.g., buying a gun, collecting pills) or preparing for one's death by suicide (e.g., writing a suicide note, giving things away).
Physical Injury (paraphrased):	A bodily lesion resulting from acute overexposure to energy (this can be mechanical, thermal, electrical, chemical, or radiant) interacting with the body in amounts or rates that exceed the threshold of physiological tolerance (e.g., bodily harm due to suffocation, poisoning or overdoses, lacerations, gunshot wounds, etc.). Refer to the Classification System for the Centers for Disease Control and Prevention definition.
Interrupted By Self or Other:	A person takes steps to injure self but is stopped by self/another person prior to fatal injury. The interruption may occur at any point.
Suicide Attempt:	A non-fatal self-inflicted potentially injurious behavior with any intent to die as a result of the behavior.
Suicide:	Death caused by self-inflicted injurious behavior with any intent to die as a result of the behavior.

Reminder: Behaviors Trump Thoughts

The only WRONG way to address suicide is NOT to….

Managing Affective Distress

- Improving caregiver psychological health
  - (Raj et al., 2014)
- CBT/ACT
  - Thought stopping
  - Relaxation techniques
- Watch psychobiotic research
  - Nutrition is key

Progressive Muscle Relaxation

Our bodies respond automatically to stressful situations thoughts by becoming tense. The opposite relationship also works: a good way of relaxing the mind is to deliberately relax the body.

In a progressive muscle relaxation each muscle group is tensed in turn, and the tension is then released. This relaxes the muscles and allows you to notice the contrast between tension and relaxation.

Relaxaton should be enjoyable so if any part of the exercise is too difficult skip it for the moment. If you have any injuries you may wish to leave out that part of the exercise.

Preparation

Lie down flat on your back, on a firm bed, a couch, or on the floor. Support your head and neck with a pillow or cushion. Alternativelty sit in a comfortable chair with your head well-supported. Close your eyes if you are comfortable doing so.

Instructions

Focus your attention on different parts of your body in sequence. Go through the sequence three times:

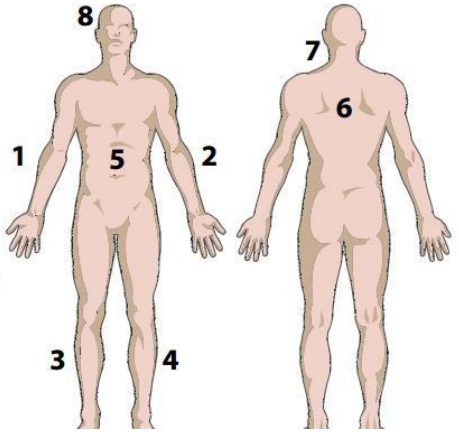
1) Tense & release: Tense that body part, hold it for a few moments, then relax

2) Lightly tense & release: Tense that body part with just enough tension to notice, then relax

3) Release only: Just pay attention to each muscle group and decide to relax it

Recommended sequence

1 Right hand & arm
(clench the fist & tighten the muscles in the arm)
2 Left hand & arm
3 Right leg
(tense the leg, lifting the knee slightly)
4 Left leg
5 Stomach & chest
6 Back muscles
(pull the shoulders back slightly)
7 Neck & throat
(push the head back slightly into the pillow/surface)
8 Face
(scrunch up the muscles in your face)



CBT Examples

1. Normalizing post-injury symptoms and emphasizing their non-malignant nature
2. Providing an optimistic prognosis and estimate of likely recovery time
3. Explaining the nature of, and how to cope with, impairments
4. Describing how symptoms can be used as a ‘temperature gauge’ indicating when to increase or decrease demands and take breaks
5. Facilitating graduated return to work and other premorbid activities when sufficient recovery has occurred
6. Explaining the nature of, and how to minimize, the vicious circle of stress and post-injury symptoms (e.g., sleep problems, pain) becoming mutually exacerbating

Tobias Harris says sleep deprivation will be an NBA issue akin to NFL's concussions

Sleep Disturbance after TBI

- Up to 80% report sleep problems after injury
  - Insomnia, increased sleep need, and excessive daytime sleepiness
  - Also sleep-related breathing disorder or post-traumatic hypersomnia
    - **(Ouellet, Beaulieu-Bonneau, & Morin, 2015)**
- A 2012 meta-analysis of sleep problems after TBI=29% of patients have insomnia, 25% have sleep apnea, 28% have hypersomnia, and 4% have narcolepsy
  - (Mathias & Alvaro, 2012)

- Disrupted sleep undermines rehabilitation, recovery, and outcomes
  - May actually mediate relationship to poor short- and long-term outcomes
    - **(Mollayeva, Mollayeva, Pacheco, D'souza, & Colantonio, 2019)**
  - Disrupted sleep impairs neural remodeling
  - TBI patients with sleep disorders perform significantly worse in sustained attention and short-term memory
- Changes can be permanent regardless of injury severity without intervention

Unique Vulnerability for Veterans

- In VA/DoD research, sleep problems mediated 26% of TBI's effect on the development of PTSD
  - Sleep problems mediated 41% of TBI's effect on development of depression
    - **(Macera et al., 2013)**

•Sleep difficulties are a risk factor for the development and maintenance of PTSD.

- Polytrauma Clinical Triad (PCT)=posttraumatic stress disorder (PTSD), traumatic brain injury (TBI), and chronic pain
  - Sleep and suicide?
  - See **Sullivan-Tibbs, Thompson, Nugent, & Baker (2019). Sleep Disturbances and Suicide—New Battles for Veterans of U.S. Wars in Afghanistan and Iraq: A Retrospective Review. *Social Work in Mental Health 17(2)*, p. 222-36.**

Why and How

- Existing vulnerability
- Complex interplay between pathophysiological processes (structural, neuroelectrical, or neurochemical levels), psychological factors (e.g., sleep-related habits or TBI-related psychopathology), environmental factors (e.g., noises, light, or pain), and social factors (e.g., social roles related to work or family)
- Decreased secretion of hypocretin
  - A neuropeptide involved in sleep-wake regulation
    - **(Baumann et al., 2015)**

Assessment (and Tracking) of Sleep Problems

First….Address Rule-Outs

- Rule out and treat medical, psychiatric, and environmental causes of sleep disorders after TBI
  - E.g., anxiety, chronic pain, alcoholism, parkinsonism, dementia/delirium, depression, gastroesophageal reflux disease, chronic obstructive pulmonary disease, asthma, atherosclerotic cardiovascular disease, diabetes mellitus, and thyroid disease
  - **(Thaxton and Myers, 2002)**

- **Pittsburgh Sleep Quality Index (PSQI)**
  - 19 items
    - Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction.
    - Five additional questions rated by the respondent's roommate or bed partner
      - **(Buysse, D., Reynolds, C., Monk, T., Berman, S., & Kupfer, D. [1989]. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28[*2], 193-213.)**
  - AVAILABLE FOR FREE HERE https://www.med.upenn.edu/cbti/assets/user-content/documents/Pittsburgh%20Sleep%20Quality%20Index%20(PSQI).pdf

Name_____ Date_____

Sleep Quality Assessment (PSQI)

What is PSQI, and what is it measuring?

The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates "poor" from "good" sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month.

INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

During the past month,

1. When have you usually gone to bed? _____
2. How long (in minutes) has it taken you to fall asleep each night? _____
3. What time have you usually gotten up in the morning? _____
4. A. How many hours of actual sleep did you get at night? _____
   B. How many hours were you in bed? _____

5. During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
A. Cannot get to sleep within 30 minutes				
B. Wake up in the middle of the night or early morning				
C. Have to get up to use the bathroom				
D. Cannot breathe comfortably				
E. Cough or snore loudly				
F. Feel too cold				
G. Feel too hot				
H. Have bad dreams				
I. Have pain				
J. Other reason (s), please describe, including how often you have had trouble sleeping because of this reason (s):				
6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?				
9. During the past month, how would you rate your sleep quality overall?	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)

Scoring

Component 1	#9 Score	C1 _____
Component 2	#2 Score (<15min (0), 16-30min (1), 31-60 min (2), >60min (3)) + #5a Score (if sum is equal 0=0; 1-2=1; 3-4=2; 5-6=3)	C2 _____
Component 3	#4 Score (>7(0), 6-7 (1), 5-6 (2), <5 (3)	C3 _____
Component 4	(total # of hours asleep) / (total # of hours in bed) x 100 >85%=0, 75%-84%=!, 65%-74%=2, <65%=3	C4 _____
Component 5	# sum of scores 5b to 5j (0=0; 1-9=1; 10-18=2; 19-27=3)	C5 _____
Component 6	#6 Score	C6 _____
Component 7	#7 Score + #8 score (0=0; 1-2=1; 3-4=2; 5-6=3)	C7 _____

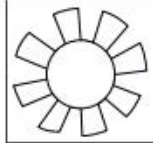
Add the seven component scores together _____ *Global PSQI* _____

A total score of "5" or greater is indicative of poor sleep quality.
If you scored "5" or more it is suggested that you discuss your sleep habits with a healthcare provider

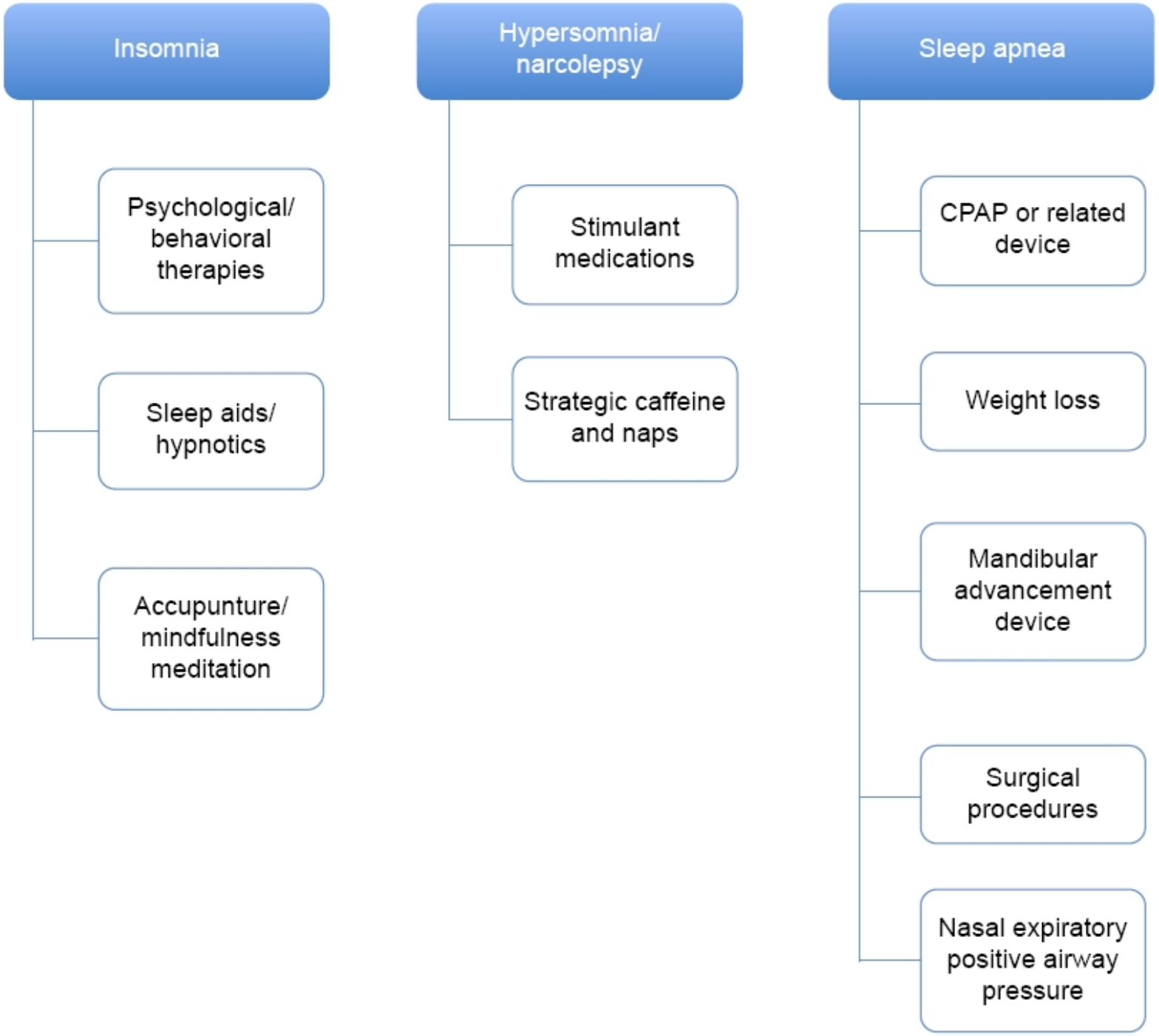
If Standardized Assessment is Not available, use BEARS* Sleep Assessment as a guide

- **B** - bedtime problems?
- **E** - excessive sleepiness during the day?
- **A** - awakenings at night?
- **R** - regularity of sleep (number of hours)?
- **S** - sleep disorders...including sleep apnea and snoring
- Also, may inquire about lifestyle factors impacting sleep such as work schedule, alcohol use, illness, medications, bed sharing arrangements, etc....

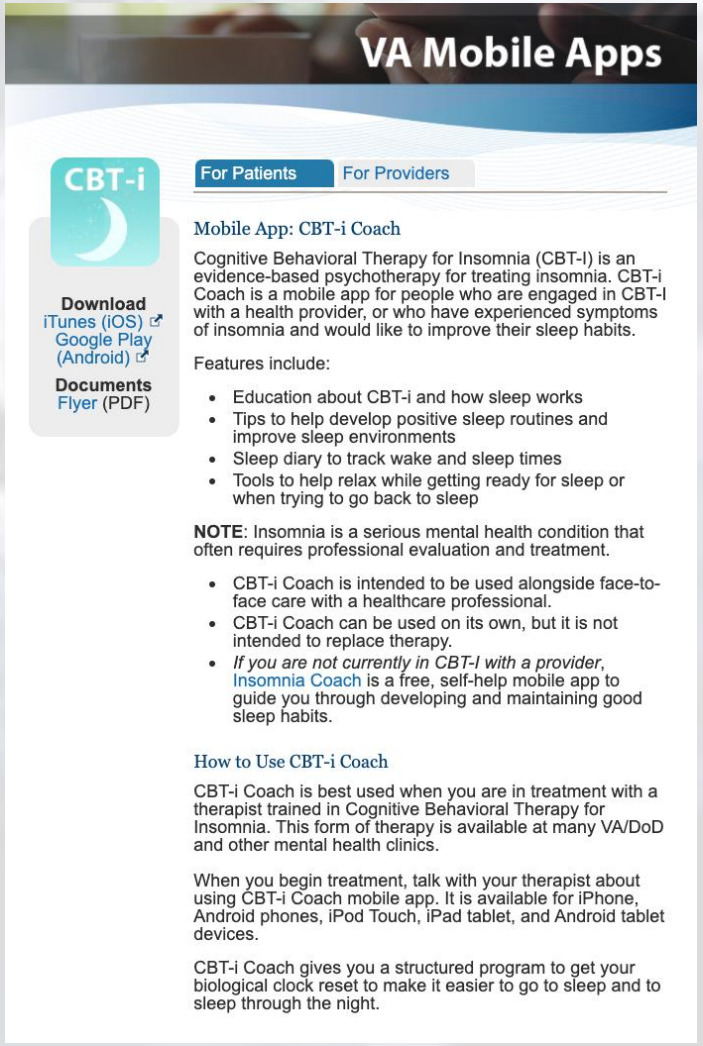
Sleep Diary

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
 **Complete in the MORNING**							
I went to bed last night at (time)							
I got up this morning at (time)							
I slept for a total of (hours)							
I woke up during the night (# times)							
 **Complete in the EVENING**							
Number of caffeinated drinks today							
Time of last caffeinated drink							
Exercise completed today (minutes)							
What I did in the hour before I fell asleep							
Mood today? (0=awful, 10=great)							

Interventions


Insomnia
Psychological/ behavioral therapies
Sleep aids/ hypnotics
Accupunture/ mindfulness meditation
Hypersomnia/ narcolepsy
Stimulant medications
Strategic caffeine and naps
Sleep apnea
CPAP or related device
Weight loss
Mandibular advancement device
Surgical procedures
Nasal expiratory positive airway pressure

Cognitive Behavioral Therapy-Insomnia (CBT-I)



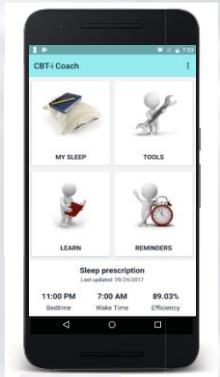
National Center for PTSD

CBT-i COACH

CBT-i Coach is a free, easy-to-use mobile application. It was released by the Department of Veterans Affairs (VA) in 2013. The app is meant to be used by Veterans, Servicemembers, and others who have trouble sleeping and are engaged in Cognitive Behavioral Therapy for Insomnia (CBT-I) with a clinical provider. Although CBT-i Coach can be used on its own, it is not meant to replace therapy for those who need it.

WHAT IS CBT-I?

CBT-I is a non-medication evidence-based treatment for insomnia that is based on scientific knowledge about sleep. The goals of CBT-I are to help you fall asleep and stay asleep. When your sleep improves, so will your daytime functioning. The "cognitive" part of CBT-I focuses on your thoughts and feelings about sleep. The "behavioral" part helps you change habits to help you sleep better.



GET IT ON Google Play

Download on the App Store

LEARN ABOUT SLEEP

Read articles on topics, like:

- The stages of sleep
- PTSD and sleep
- Nightmares

Find out which habits can prevent you from sleeping, including:

- Worrying in bed
- Napping late in the day
- Consuming caffeine, alcohol, or nicotine close to bedtime

USE TOOLS TO HELP YOU SLEEP

Get tips on how to quiet your mind before you sleep and prevent insomnia in the future. The tools section of the app can also help you create new sleep habits, like:

- Going to bed only when you're sleepy
- Getting out of bed when you can't sleep
- Setting up a sleep environment that is quiet, dark, safe, and comfortable

YOUR SLEEP DIARY: THE KEY TO BETTER SLEEP

Use CBT-i Coach to keep a daily sleep diary. When you wake in the morning, record your sleep experiences from the night before. Important details include what time you got into bed, what time you tried to fall asleep, and how many times you woke during the night.

When you have recorded your sleep over five nights, the app will offer you a "sleep prescription." Your prescription will suggest a bedtime and wake-up time based on your sleep patterns. This prescription can help you set a regular sleep schedule and reduce unwanted wakefulness during the night.

TRACK PROGRESS WITH REMINDERS

Use the app's reminders to help you stick with your new habits. Schedule regular assessments to measure your progress as your sleep habits improve.

REFERENCE

Owen, J., Kuhn, E., Jaworski, B., McGee-Vincent, P., Juhasz, K., Hoffman, J., & Rosen, C. (2018). VA mobile apps for PTSD and related problems: Public health resources for veterans and those who care for them. *mHealth*. doi:10.21037/mhealth.2018.05.07

Sleep Hygiene

Guidelines For Better Sleep

Sleeping well is a habit that you can learn! Small changes can have big effects. Start today by following these rules:

Take care of your body
- Do not drink caffeine: no tea, coffee, or coca-cola after 4 o'clock
- Do not eat a big or spicy meal late in the evening
- Do not go to bed hungry
- Avoid alcohol as it interferes with sleep

Physical exercise, such as a brisk walk, in the late afternoon can help to make your body tired and help you to sleep. Try to do some exercise every day.

Sleep only at night-time and do not have day-time naps, no matter how tired you feel. Naps keep the problem going by making it harder for you to get to sleep the next night.

Having a regular bedtime routine teaches your body when it's time to go to sleep.
- Have a soothing drink like camomile tea or a milky drink
- Have a bath, or a routine of washing your face and brushing your teeth
- Go to bed at same time each night
- When in bed think of nice things (e.g. think of 5 nice things that happened that day – they might be big or small, such as a nice conversation, seeing the sunshine, or hearing nice music on the radio)
- Do a relaxed breathing exercise (one hand on stomach the other on your chest, deliberately slow your breathing, breathe deeply in your stomach instead of high in your chest)
- Try and wake up the same time every day, even if this is tiring to begin with

Coping with bad dreams can be difficult. Some people don't like relaxation before going to sleep, or are scared of letting go. If that is you, try these preparation techniques instead:
- Prepare yourself in case you have bad dreams by thinking of a bad dream then think of a different ending for it. Practice this new ending many times before going to sleep.
- Before going to sleep prepare to re-orient yourself when you wake from a bad dream.
- Remind yourself that you are at home, that you are safe. Imagine your street, buses, local shops.
- Put a damp towel or a bowl of water by the bed to splash your face, place a special object by the bed, such as a photograph, or a small soft toy.
- Practice imagining yourself waking up from a bad dream and reorienting yourself to the present, to safety by splashing your face, touching special object, having a bottle of rose or lavender essential oil to sniff, going to window to see surroundings.
- When you wake up from a bad dream- move your body if you can and reorient yourself immediately (touching an object, wetting face, going to the window, talk to yourself in a reassuring way)

Make your bedroom a pleasant place to be
- Get a nightlight
- Keep it clean and tidy
- Introduce pleasant smells such as a drop of lavender oil onto the pillow
- Get extra pillows
- Make sure that your home is safe e.g. doors locked, windows closed.

REMEMBER: Bed is for sleeping, so if you cannot sleep after 30 minutes, get up and do another activity elsewhere such as reading or listening to music (try and avoid TV as it can wake you up). After 15 minutes return to bed and try to sleep again. If you still can't sleep after 30 minutes get up again. Repeat this routine as many times as necessary and only use your bed for sleeping in.

Progressive Muscle Relaxation

Progressive Muscle Relaxation

Our bodies respond automatically to stressful situations thoughts by becoming tense. The opposite relationship also works: a good way of relaxing the mind is to deliberately relax the body.

In a progressive muscle relaxation each muscle group is tensed in turn, and the tension is then released. This relaxes the muscles and allows you to notice the contrast between tension and relaxation.

Relaxaton should be enjoyable so if any part of the exercise is too difficult skip it for the moment. If you have any injuries you may wish to leave out that part of the exercise.

Preparation

Lie down flat on your back, on a firm bed, a couch, or on the floor. Support your head and neck with a pillow or cushion. Alternativelty sit in a comfortable chair with your head well-supported. Close your eyes if you are comfortable doing so.

Instructions

Focus your attention on different parts of your body in sequence. Go through the sequence three times:

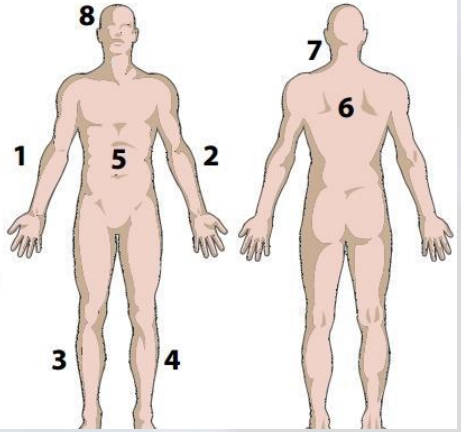
1) Tense & release: Tense that body part, hold it for a few moments, then relax

2) Lightly tense & release: Tense that body part with just enough tension to notice, then relax

3) Release only: Just pay attention to each muscle group and decide to relax it

Recommended sequence

1 Right hand & arm
(clench the fist & tighten the muscles in the arm)
2 Left hand & arm
3 Right leg
(tense the leg, lifting the knee slightly)
4 Left leg
5 Stomach & chest
6 Back muscles
(pull the shoulders back slightly)
7 Neck & throat
(push the head back slightly into the pillow/surface)
8 Face
(scrunch up the muscles in your face)



Strategic Napping

How Long to Nap

10 to 20 Minutes

This power nap is ideal for a boost in alertness and energy, experts say. This length usually limits you to the lighter stages of non-rapid eye movement (NREM) sleep, making it easier to hit the ground running after waking up.

30 Minutes

Some studies show sleeping this long may cause sleep inertia, a hangover-like groggy feeling that lasts for up to 30 minutes after waking up, before the nap's restorative benefits become apparent.

60 Minutes

This nap is best for improvement in remembering facts, faces and names. It includes slow-wave sleep, the deepest type. The downside: some grogginess upon waking up.

90 Minutes

This is a full cycle of sleep, meaning the lighter and deeper stages, including REM (rapid eye movement) sleep, typically likened to the dreaming stage. This leads to improved emotional and procedural memory (i.e. riding a bike, playing the piano) and creativity. A nap of this length typically avoids sleep inertia, making it easier to wake up.

Primary insomnia *or* TBI=<20 minute nap

Cognitive and Functional Complaints

Self-Reported Deficits and Materials Adult

SYMPTOMS QUESTIONNAIRE

Name: _____ Date: _____

In recent weeks, how much have you been bothered by the following problems?
Please mark only one circle per item.

SECTION 1	**I do not experience** this problem at all	I experience this problem but it **does not bother me**	**I am mildly bothered** by this problem	**I am moderately bothered** by this problem	**I am extremely bothered** by this problem
Losing or misplacing important items (e.g., keys, wallet, papers)	○	○	○	○	○
Forgetting what people tell me	○	○	○	○	○
Forgetting what I've read	○	○	○	○	○
Losing track of time	○	○	○	○	○
Forgetting what I did yesterday	○	○	○	○	○
Forgetting things I've just learned	○	○	○	○	○
Forgetting meetings/appointments	○	○	○	○	○

CUESTIONARIO SOBRE SÍNTOMAS

Nombre: _____ Fecha: _____

En las últimas semanas, ¿cuánta molestia ha sentido debido a los siguientes problemas?
Marque solo un círculo por renglón.

SECCIÓN 1	**No tengo para nada** este problema	Tengo este problema pero **no me molesta**	**Este problema me** molesta un poco	**Este problema me** molesta moderadamente	**Este problema me** molesta mucho
Perder o extraviar cosas importantes (por ej. llaves, billetera, documentos)	○	○	○	○	○
Olvidarme de lo que me dicen otras personas	○	○	○	○	○
Olvidarme de lo que leí	○	○	○	○	○
Perder la noción del tiempo	○	○	○	○	○
Olvidarme de lo que hice ayer	○	○	○	○	○
Olvidarme de cosas que acabo de aprender	○	○	○	○	○

Self-Reported Deficits and Materials Youth

JUVENILE SYMPTOMS QUESTIONNAIRE

Name: _____ Date: _____

In the past two months, how much have you been bothered by the following problems?
Please only mark one box per item.

SECTION 1	I do not **experience** this problem at all	I experience this problem but it **does not bother me**	I am mildly **bothered** by this problem	I am moderately **bothered** by this problem	I am extremely **bothered** by this problem
Losing or misplacing important items (e.g., homework, backpack, phone)	○	○	○	○	○
Forgetting what people tell me	○	○	○	○	○
Forgetting what I've read	○	○	○	○	○
Losing track of time	○	○	○	○	○

Cuestionario de Síntomas para Adolescentes

Nombre: _____ Fecha: _____

En los últimos dos meses, ¿cuánto te han molestado los siguientes problemas?
Marque solo una casilla por artículo.

SECCIÓN 1	No tengo este problema en absoluto	Tengo este problema, pero no me molesta	Estoy un poco molesto por este problema	Estoy molesto por este problema	Estoy extremadamente molesto por este problema
Pierdo o extravío artículos importantes (por ejemplo, tarea, mochila, teléfono)	○	○	○	○	○
Olvido lo que la gente me dice	○	○	○	○	○
Olvido lo que he leído	○	○	○	○	○
Pierdo la noción del tiempo	○	○	○	○	○
Olvido lo que hice ayer	○	○	○	○	○
Olvido cosas que acabo de aprender	○	○	○	○	○
Olvido clases, prácticas o citas.	○	○	○	○	○
Olvido apagar las luces o electrónicos (computadora, dispositivos de juego, etc.)	○	○	○	○	○

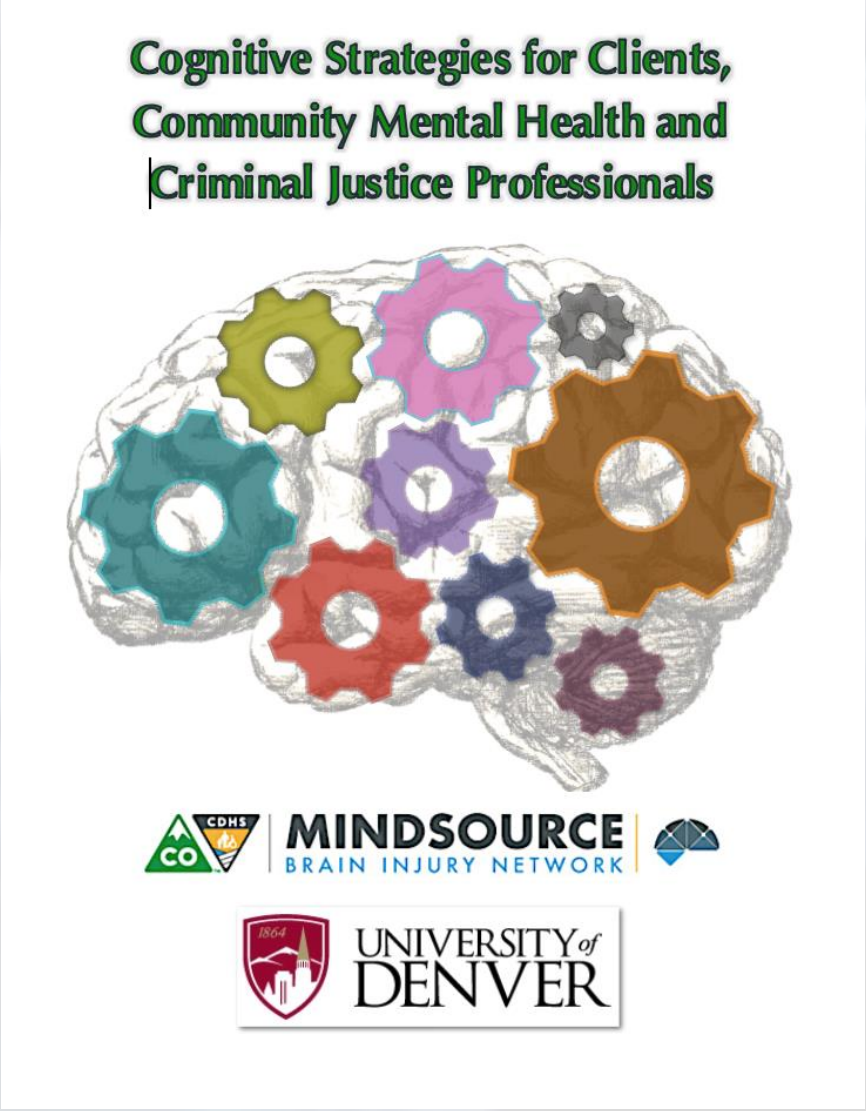
And once you know what your client's functional complaints are….you have to DO something about it

IMPAIRMENT	SIGNS	ACCOMODATIONS
Impaired Attention	Fidgets, squirms in seat, can't sit still; Interrupts conversation; Low frustration tolerance; Talks excessively; Off topic; Inability to inhibit impulses	Work on only one task at a time; Have client participate in discussion & development of case plan; Reduce distractions; Meet in quiet environment; Use verbal (e.g. "look", "listen") & non-verbal (e.g. eye contact) cues
Inhibition	Fidgets, squirms in seat, can't sit still; Interrupts conversation; Talks excessively; Not able to respond to multi-step instructions; Acts on the first thing that pops into their mind; Unable to verbally, physically, or mentally "put on the brakes"; Difficulties with transitions (space to space & task to task)	Provide & help create structure & routine; Mindfulness; Provide cuing; Direct, honest, & kind feedback; Prepare for transitions
Processing Speed	Slow to respond to questions; Appears to not be paying attention; Looks confused; Doesn't follow instructions	Provide additional time to review information; Speak slowly, making sure the client understands (ask them to rephrase back to you what they heard); Offer assistance with completing forms; Utilize checklists & a written schedule of routines; Provide written cues to organize information (e.g. "first do this, then do this")
Memory Loss	Can't remember more than one thing at a time; Can't remember details; Appears disorganized; Appears to have an "attitude" problem; Appears manipulative	Repeat information & summarize; Teach client to use a reminder system, e.g. planner; Teach "chunking" as a way to aid in retention; Stick to routine as much as possible; Keep information tangible & relevant
Sensory Motor	Appear overwhelmed; Emotionally melt down; Irritable, short fused; May appear oppositional; Shuts down	Keep environment quiet; Keep noise & lights to a minimum; Keep sessions short to minimize the onset of headaches & fatigue; Schedule rest periods & breaks from planned activities
Language / Social Pragmatics	Do not interpret body language; Use inappropriate eye contact; May get in your space; May say either too little or too much; Have little insight or awareness of how their behavior may be inappropriate	Provide direct, structured, & concrete feedback; Do not rely on body language to convey a message; Role play; Provide shaping, cueing, & fading; Videotaping interactions
Receptive Language	Confused; May say "huh" frequently; Followers; Struggle with abstract language/sarcasm; May withdraw	Be direct; Avoid abstract humor, sarcasm, metaphors, colloquialisms; Allow wait time for person to process what has been said; Provide instructions/directions slows & one at a time; Ask if it would be helpful to repeat or rephrase your message; Let the individual know that you value their input, thoughts & feelings
Expressive Language	Poor grammar or immature speech; Difficult to follow in conversation; Difficulty staying on topic; Difficulties navigating social rules; May withdraw	Redirect if the client is off topic; Provide opportunities to practice expression; Role play common real life conversations; Teach individual to rehearse silently before replying; Be patient & allow the client time to respond
Initiation Deficits	Appears lazy or spacey; Appears unmotivated; Follower; Needs constant cueing; Lags in independent living skills	Provide written instructions; Ask client to repeat instructions to ensure comprehension; Use underlining or highlighting for significant instructions; Break complex directions into simple steps & assign action items; Utilize color coding; Help the client get started; Repeat instructions or interventions multiple times in multiple ways
Mental Flexibility	Perseverate; Difficulties taking feedback; Resistant; Can appear stubborn or argumentative; May appear to lack empathy	Develop & practice routines; Plan ahead for changes; Prepare for transitions; Help develop alternative plans; Ensure goals are broken down into smaller, achievable tasks; Provide respectful feedback to potential or obvious problem areas
Reasoning	Concrete thinkers; Can't think of alternative solutions; Difficulties answering open ended questions; Difficulties learning from experience, cause & effect	Point out possible short & long-term consequences of decisions; Teach step-by-step approaches to problem solving; Avoid open-ended questions; Speak concretely; Be clear on expectations & consequences of risk taking behaviors; Be supportive & continually identify strengths
Emotional / Behavioral	Over/under reaction; Difficulties with anger management; Meltdowns; Can appear emotionally "flat"; Difficulties making friends; Can appear argumentative	Minimize anxiety with reassurance, education & structure; Avoid focusing only on deficits; Don't misinterpret lack of emotion as a lack of interest; Suggest breaks if the client becomes irritable or agitated; Use mindfulness exercises to aid clients in identifying emotional states; Role play

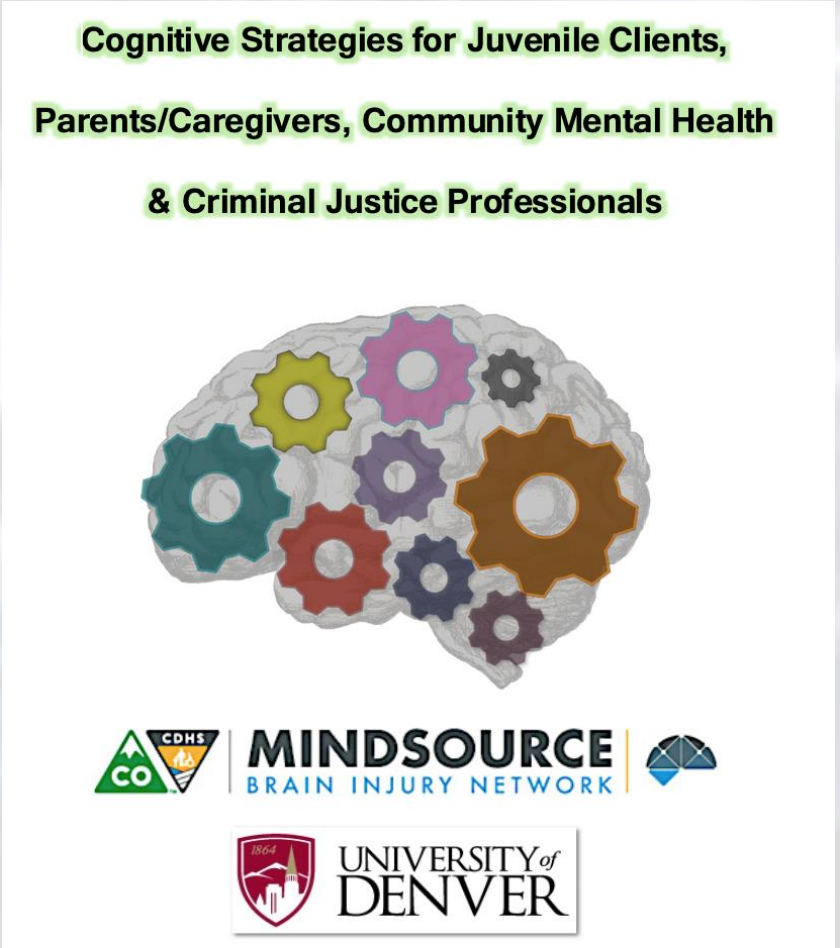
Deficit-Specific Interventions

- Attention/Concentration
  - Reduce distractions; use cue words to alert the client to pay attention ("look", listen"); establish nonverbal cueing system (eye contact, touch)
- Memory
  - Repeat information and summarize; teach client to use reminder system like planner; teach "chunking" as a way to aid in retention
- Organization
  - Additional time to review information; checklists; written schedule of routines; use of color-coding; written cues for organizing ("first do this, then do this")
- Following Directions
  - Provide written instructions; asking client to repeat instructions; use underlining and highlighting for significant parts of directions; break complex directions into simple steps; repeat instructions or interventions multiple times in different ways
- Emotional Awareness/ Mindfulness
  - Mindfulness exercises to aid clients in accurately identify internal emotional states; progressive relaxation; body scans; deep breathing exercises

Strategies and Accommodations ADULT



Strategies and Accommodations YOUTH



Never underestimate the transformative power of Self-Advocacy

Self-Advocacy ADULT

Achieving Healing through Education, Accountability, Determination (AHEAD)

- Group psycho-educational curriculum
- Can be used individually
- TBI-focused, but relevant for other populations as well

Seven Modules:

1. *Understanding TBI/Symptom Recognition*
2. *Memory Skills/Goal Setting*
3. *Emotional Regulation*
4. *Communication Mastery*
5. *TBI and Anger*
6. *Stopping & Thinking*
7. *Grief*

https://mindsourcecolorado.org/ahead/

Self-Advocacy YOUTH

A.H.E.A.D

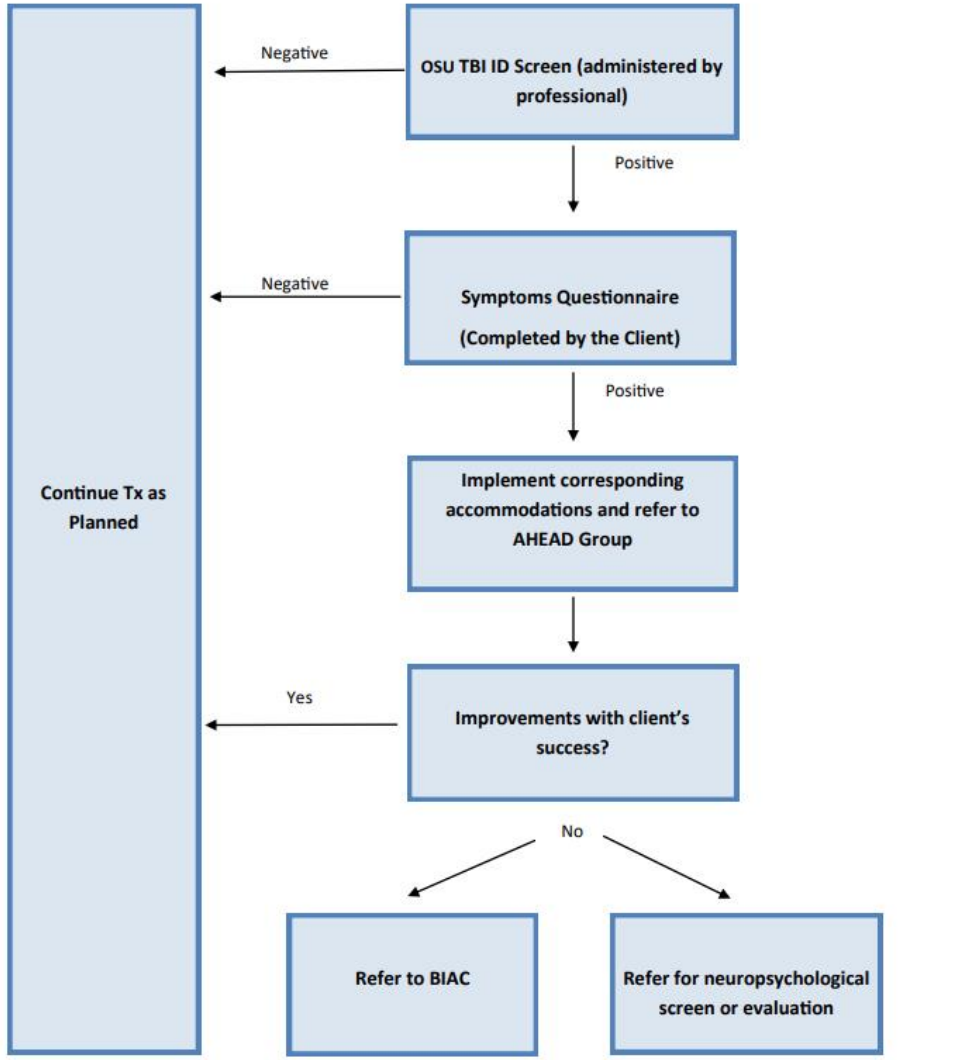
Achieving Healing through Education, Accountability, and Determination:
A Psycho-Educational Curriculum for Traumatic Brain Injury:
A Facilitator's Guide to Traumatic Brain Injury Education and Skill-Building For Youth.

URL Coming soon from www.BIAColorado.org

Do you need more than a self-report cognitive screen?

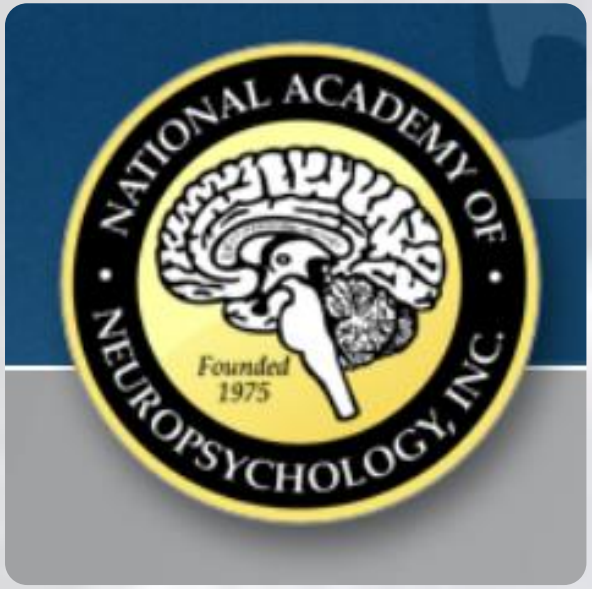
Brain Injury Screening and Supports Protocol– Process Flow

*note: referral can be made to BIAC at any point in process if client screened positive AND there is need for case management support and/or professional consultation



Brain Injury Alliance COLORADO

CDHS MINDSOURCE BRAIN INJURY NETWORK



Find A Neuropsychologist

- National Academy of Neuropsychology
- The American Board of Clinical Neuropsychology (ABCN) is a specialty board of the American Board of Professional Psychology (ABPP)
- The American Board of Professional Neuropsychology (ABN)
- **Society for Clinical Neuropsychology (SCN)/Division 40 of the American Psychological Association**

And Remember....

Priority Considerations

- **Behavioral Health Risks**
  - ***Prioritize*** **access to physical healthcare, SUD/OUD treatment, and mental health care**
  - **National Suicide Prevention Lifeline 800-273-TALK (8255)**
  - Confidential Veterans Crisis Line at 1-800-273-8255 (1-800-273-TALK) or text to #838255
- **ALWAYS CONSIDER**
  - **Risk for risky decision-making**
  - **Risk for attracting predators (older & younger people and women especially)**
  - **Risk for future injury**

Bookmark These Other Resources

TBI Toolkit

www.mirecc.va.gov/visn19/tbi_toolkit

Free Online Toolkit

MIRECC
VISN 19 ROCKY MOUNTAIN NETWORK

Developed by researchers at the Department of Veterans Affairs, this toolkit is designed to assist providers in identifying TBI and associated co-occurring problems and determining potential need for further evaluation and/or mental health treatment modification.

Click here to access the toolkit. Click here and open the "Training Resources" menu for valuable slides from the initial training on this toolkit.

The goal is to offer providers working with clients who have a history TBI and mental health symptoms the following:

- Background information/Education
- Screening and Assessment Tools
- Interventions and Treatment Modification Suggestions
- Additional resources

Ohio State University
Accommodating the Symptoms of TBI

Presented by

Ohio Valley Center for Brain Injury Prevention and Rehabilitation

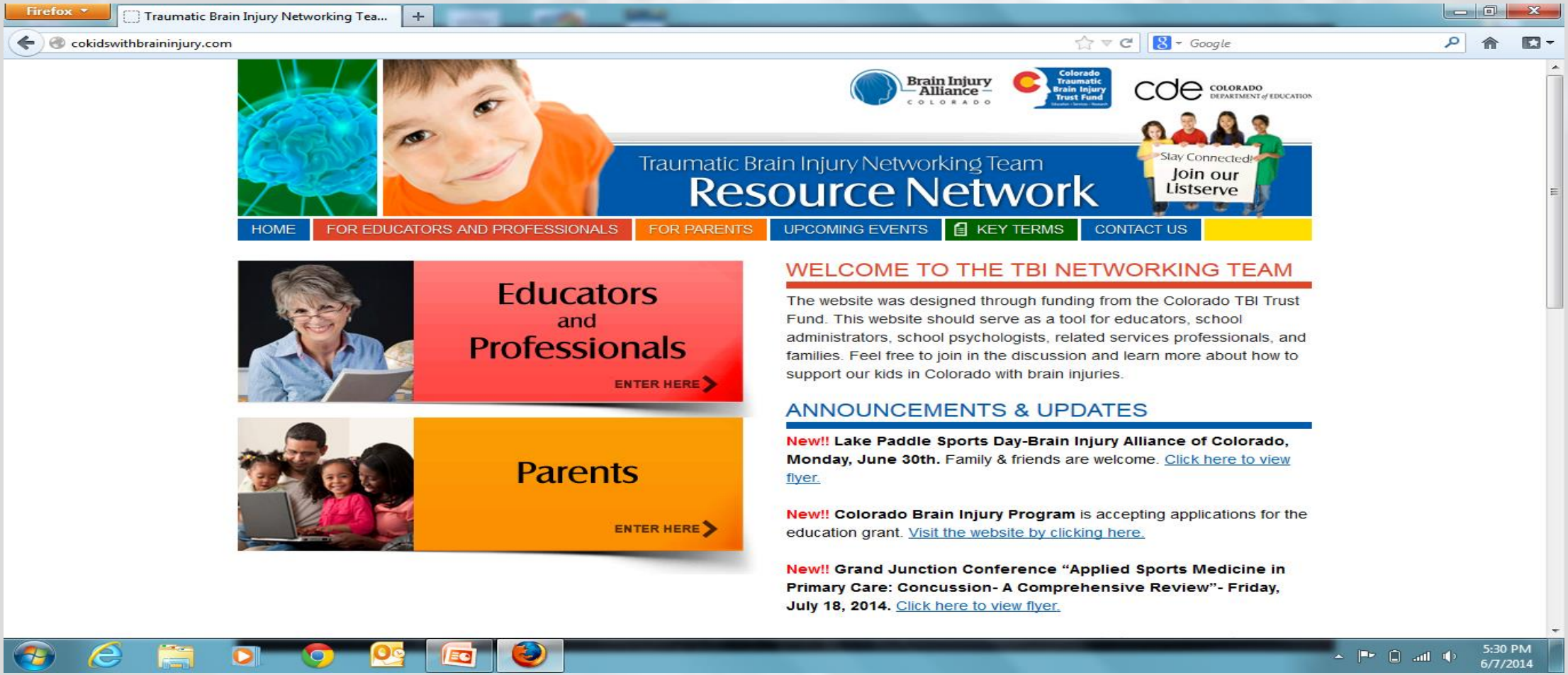
with contributions from Minnesota Department of Human Services State Operated Services

Developed in part with support of a grant from the US Department of Health and Human Services, Health Resources and Services Administration (HRSA) to Ohio Rehabilitation Services Commission and The Ohio State University

Order here https://osuwmcdigital.osu.edu/sitetool/sites/ohiovalleypublic/documents/AccommodationOrderForm2019.pdf

Colorado Kids with Brain Injury

www.cokidswithbraininjury.com



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Questions?

Thank you for joining!

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