SAMHSA
Substance Abuse and Mental Health Services Administration

November 2021

Traumatic Brain Injury and Substance Use Disorders:
Making the Connections

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Mountain Plains ATTC (HHS Region 8)
ATTC Addiction Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

Mid-America (HHS Region 7)
ATTC Addiction Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

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PURPOSE AND AUDIENCE

The Mid-America Addiction Technology Transfer Center[1], the Mountain Plains Addiction Technology Transfer Center[2], and the National Association of State Head Injury Administrators (NASHIA)[3] provide this free toolkit to you entitled *Traumatic Brain Injury and Substance Use Disorders: Making the Connections*. We hope you will take the opportunity to read this document and share it throughout your networks.

This toolkit merges the content on traumatic brain injury (TBI) and substance use disorders (SUD) to expand the capacity to address both issues in treatment. It is a resource for behavioral health treatment providers, healthcare providers, educators, and health and human service administrators to gain a deeper understanding of the impact of SUD on persons who have survived a TBI. The merging of the two fields expands the capacity of providers to address both concerns, with a specific recommendation for treatment protocols and screening tools.

This toolkit also provides evidence-based content for serving people with a TBI and SUD. The author provides information on evidence-based screening tools, along with specific recommendations for accommodating cognitive impairment. In addition, the author provides suggestions for modifying the service delivery system to make the necessary accommodations to provide treatment that is more effective in serving this population. A series of case vignettes offers readers specific suggestions for effective treatment interventions.

The four Sections encompassed in the toolkit provide valuable information for advancing behavioral health providers' capacity when serving persons who have brain injuries. It also describes the toxic effects of substance use in persons diagnosed with a brain injury. The scientific content in Section 1 for enhancing readers' understanding of the behavioral implications of a brain injury is accompanied by visual images of the brain. A Section on evidence-based tools for use in screening for brain injury is in Section 2, with strong encouragement to advance screening for brain injury. This Section also offers hands-on guidance on the use of the screening tools. Section 3 addresses neurocognitive problems, with specific suggestions regarding techniques for supporting clients with a traumatic brain injury. These techniques are described through the application of case vignettes that guide the reader in skill development. Section 4 provides the vignette of Gerry as an example of the importance of practitioners' use of evidence based practice, based on a provider guide for intervention, including guidance on how to use environmental support to address cognitive difficulties.

In summary, the toolkit includes content to enhance skills and resources among providers of substance use disorder services and other behavioral health treatment providers. The Mid-America and Mountain Plains ATTCs and NASHIA came together to provide critically important content regarding the negative impact of the use of alcohol and other drugs on treatment outcomes for persons with a brain injury. Readers will note that this toolkit underscores the importance of behavioral health clinicians providing necessary accommodations in treatment when serving persons with brain injuries. Throughout this toolkit and in case examples, an emphasis is placed on the negative impact on the use of substances among persons with a brain injury.

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[1] The Mid-America ATTC serves the states of Iowa, Kansas, Missouri, and Nebraska (HHS Region 7) through a collaboration between the Truman Medical Center and the University of Missouri-Kansas City. They serve multidisciplinary practitioners, agencies, and communities in implementing evidence-based practices for helping people with substance use disorders (SUD), with a focus on treatment and recovery supports.

[2] The Mountain Plains ATTC serves the states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming (HHS Region 8) through a collaboration between the University of North Dakota and the University of Nevada-Reno. Their focus is to enhance treatment and recovery supports for individuals with SUDs and their family members in these six states. The emphasis is on serving providers in rural communities, with a focus on accessible learning opportunities.

[3] The National Association of State Head Injury Administrators assists state governments throughout the United States in promoting partnerships and building systems to meet the needs of individuals with brain injuries and their families.

RATIONALE for TOOLKIT

Traumatic Brain Injury (TBI) is a common but often undiagnosed co-occurring condition with substance use disorders. Depending on the setting you work in, one-quarter to one-half of the people you serve will report a history of brain injury with some loss of consciousness.[1-3] Those who do report a history of brain injury will also have longer and more severe histories of substance use and more co-occurring behavioral health issues. For this reason, as many as 75% of the people seeking services for concurrent mental health and substance use disorders are living with the effects of brain injury.[2] In most settings, the bottom line is that at least one out of five people presenting for treatment of a substance use disorder is also living with the effects of brain injury.

Because brain injury is often an invisible disability, it is easy to miss and to misunderstand.
People with TBI seeking services for substance use may experience subtle but significant changes in memory, attention, problem-solving, sensation, social behavior, and self-regulation, making it difficult to remember appointments, understand expectations, follow through with tasks, and participate in group settings. Trouble with recognizing social cues and observing social norms may

make it difficult for the person with TBI to fit into and benefit from some types of services. As a result, they often leave treatment prematurely because they cannot keep up or become discouraged. It is easy to imagine how frustrating this can be for both the client and their care providers. Having the right tools to recognize and manage the impact of brain injury can make a big difference in outcomes for a significant number of the people served in programs addressing substance use disorders.

When brain injury and substance use disorders occur together, the most successful approach to care will address needs related to both conditions in an integrated way. When the problems that come with brain injury are relatively mild, it may be only a matter of understanding the symptoms that are observed and providing some simple accommodations. Often, brain injuries are complex and will require coordination among care providers. Ideally, a team of professionals that includes mental health and brain injury experts can be assembled to work together, providing services in an integrated fashion. Even when assembling the ideal team is out of reach, there are many steps providers can take to give the best possible care.

SCOPE of the PROBLEM

Approximately one in five American adults have sustained a traumatic brain injury (TBI) severe enough to result in some loss of consciousness.[4] The vast majority of these injuries are mild, with more than 90% released from emergency departments. Most people seem to recover well from mild TBI. However, substantial evidence suggests that having one or more brain injuries with loss of consciousness is associated with a significantly greater risk for behavioral health problems, including problematic substance use.[5, 6] A growing body of evidence indicates childhood TBI increases the risk for behavioral health problems, including problematic substance use beginning in adolescence.[7] Findings from research also suggest that having a history of one or more brain injuries with loss of consciousness is associated with greater symptom complexity, including more psychiatric symptoms and a significantly elevated risk of suicide.[8] TBI and substance use seem to be worse in combination than either condition is on its own. People using substances are at risk for poorer rehabilitation outcomes after TBI.[9]

Substance use is a risk factor for sustaining a brain injury.

- Between 23 and 51% of adolescents and adults sustaining a TBI were intoxicated when the injury occurred.[10, 11]
- Approximately one-quarter of people hospitalized for TBI have a history of substance use disorders.[8, 11]

TBI is a Risk Factor.

- 25 to 85% of incarcerated individuals report a history of TBI.[12] History of brain injury in this population significantly increases the risk of assault and violence, and decreases the efficacy of treatment for a mental health problem.
- Individuals who have experienced domestic abuse or assault are more likely to have sustained an Acquired Brain Injury (ABI).[13]
- People who are street-involved are more at risk for having a history of TBI before becoming homeless. Being homeless increases the risk of injury.[14]

TBI is associated with adverse health outcomes.

- People with a history of TBI of any severity are at two to four times the risk of attempting or having a death by suicide, particularly if the individual has a co-occurring psychiatric disorder.[15]

- History of TBI is associated with an increased risk of psychiatric disorders, including depression, anxiety, and PTSD.[16]
- TBI is associated with an increased risk of seizure disorder.[17]
- More than 50% of people living with TBI experience pain (most often headache).[18]
- History of TBI is associated with substance use that began earlier in life, persisted longer, and is more severe.[8]
- History of TBI may be associated with neurodegenerative disease and early cognitive decline.[19]
- Gender: males are 1.5 times more likely than females to sustain a TBI[20] (*Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation*., 2015).
- Age: children 0 to 4 years old, youth 15 to 19 years old, and older adults at risk for falls are at greater risk for TBI.[20]
- Employment and working conditions: certain military duties (e.g., paratrooper) may create the potential for TBI.[21, 22]
- Disability: having a previous TBI doubles or triples the risk of experiencing another TBI.[4]

Research suggests that there is a high incidence of cognitive impairment related to a variety of causes, including TBI, in people seeking services for substance use disorders.

Recent studies have found between 30 and 80% of clients attending inpatient programs scored below the cutoff for impairment on cognitive screening measures.[23, 24] Anoxic injuries associated with non-fatal overdose and substance-related brain injury are two common causes of injury to the brain in this client group.

- **Non-fatal Overdose.** The opioid epidemic has resulted in an increasing number of non-fatal overdoses that can potentially result in lasting changes in cognition and behavior. Overdose can result in hypoxic brain injury (loss of oxygen to the brain). It has been estimated that in North America, approximately 23% of all IV drug users will experience a non-fatal overdose per year.[25] Those who do sustain a brain injury are at risk for future overdoses. Many overdoses are unwitnessed and do not result in medical attention, so it is difficult to measure their true impact. Still, evidence points to hundreds of thousands of episodes of loss of consciousness due to overdose each year. The cognitive effects of an overdose will vary, depending on how long the oxygen supply was interrupted.
- **Substance-Related Brain Injury.** The toxic impact of drugs will also vary, depending on the substance and pattern of use. Some substance-related changes in brain function will return to normal with abstinence. Some are lasting.

ALEX'S STORY

Alex's story illustrates how emotional regulation and behavior changes during the months after a brain injury can disrupt social relationships and mood. Because there are few outward signs of injury, others may not understand the difficulty they are having with managing their usual activities. Many people using cannabis or other drugs after brain injury report that they are doing so to manage the symptoms they are experiencing. Regular use may result in dependence and other harms that outlast the period of recovery. It is common for alcohol to have a more dramatic effect after brain injury, worsening mood and slowing down recovery.

Life wasn't perfect before my accident. I might get depressed, but it never lasted that long. I was smoking marijuana, and I did do some stupid stuff with friends while we were drinking. But it was for fun—to make things interesting and to be with my friends.

But after that fall down the stairs, something shifted. Everyone said I looked great; even my doctor said that things should be totally okay, but I didn't feel normal. It seemed like everything just got on my nerves. I couldn't stand crowds or noise. Everything took longer. My girlfriend broke up with me because I was being such a jerk.
After a few months, I started to worry I wasn't going to get back to normal. I had my bell rung playing sports lots of times but never got knocked out for five minutes, like I did this time.

Getting stoned started to be something I did to feel normal. Maybe I wasn't normal, but I didn't care as much. Maybe after five months or so, I started to smoke before work. After a few beers, I'd be this angry person. I almost got arrested.

SECTION 1

BRAIN BASICS

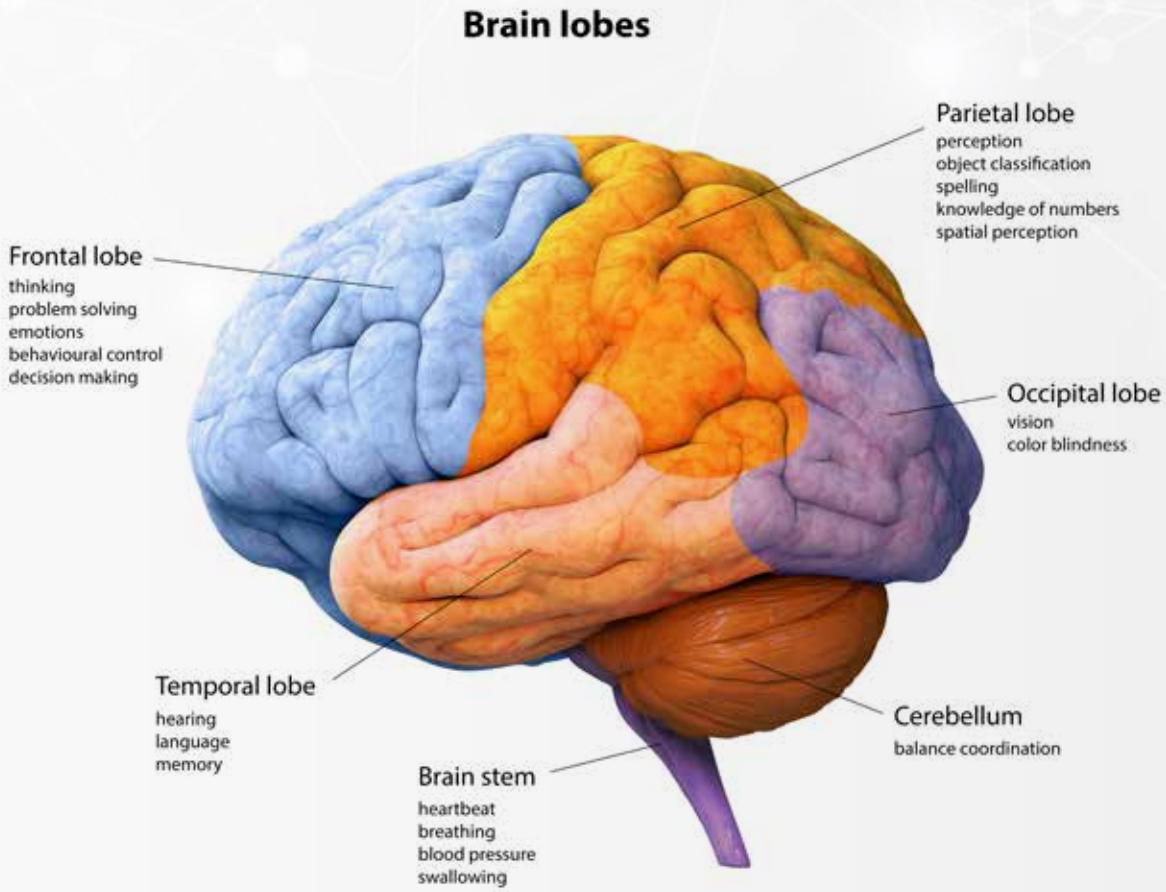
BRAIN BASICS

The brain is two to three pounds of delicate tissue which is the texture of jelly and is protected by the skull and three layers of protective membranes. Despite its relatively small size (less than 3% of a typical adult's body mass), the brain uses 20% of the energy and controls almost everything we do.

The brain evolved from the inside out, with the deepest parts of the brain (the brain stem) responsible for basic functions. As species became more complex, brain structures evolved to allow for more complex behaviors.

The brain stem is responsible for basic functions that maintain life. They include autonomic functions such as breathing and heartbeat. The limbic brain contains structures responsible for the generation and perception of emotions and directing the brain's memory. The brain's outer layer, the neocortex (or simply cortex), is responsible for most complex behaviors. (See Below)

Cerebral cortex. The brain's cortex is the grey matter or outer layer of brain tissue and is responsible for our most complex cognitive functions. However, without efficient connections within the brain, effective brain functioning would not be possible.



Our most complex behaviors are the result of interrelated circuits which connect areas of the brain. The frontal and prefrontal cortical areas are responsible for conscious thought and reasoning. They are designed to have a "top down" effect on emotions, allowing us to understand and think about what we feel and to plan action. The limbic system (the emotional part of the brain) has a "bottom-up" effect on our behavior; it generates drives (such as hunger and lust) and is responsible for how we experience rewards. It is the connections between the emotional part of our brain, the limbic system, and the frontal lobes that give our thoughts and behaviors purpose and direction. As discussed below, the connections between the frontal and limbic systems that govern response to reward are particularly vulnerable to traumatic injury. Depending on when and how the brain is injured, brain injuries can result in temporary discomfort or become a life-changing event.

Definitions

An **acquired brain injury (ABI)** is any injury to the brain that occurs after birth that disrupts some aspect of brain functioning and is not the result of a progressive disease such as dementia and is not congenital.

Traumatic brain injury (TBI) is defined as a change in brain function or structure that results from a mechanical force (a blow or jolt). TBI may be caused by the head being struck by an object, the head striking an object, acceleration/deceleration, such as whiplash or being shaken, a foreign body penetrating the skull, such as a gunshot wound or skull fragment, or forces from an explosion or blast. Not all bumps to the head cause TBI. The signs that an injury has occurred include changes in brain function such as:

A. Any period of loss of consciousness or decreased consciousness.
B. Any loss of memory for events immediately before (retrograde) or after the injury (post-traumatic amnesia).
C. Neurological deficits such as weakness, loss of balance and coordination, disruption of vision, changes in speech, language, or senses.
D. Confusion, disorientation, slowed thinking, or difficulty concentrating.

Substance Use Disorder (SUD) refers to conditions that meet the criteria in the *Diagnostic and Statistical Manual of Mental Disorders (DSM–5)*.[26] These include:

A. Taking the substance in larger amounts or for longer than you're meant to.
B. Wanting to cut down or stop using the substance but not managing to.
C. Spending a lot of time getting, using, or recovering from the use of the substance.
D. Cravings and urges to use the substance.
E. Not managing to do what you should at work, home, or school because of substance use.
F. Continuing to use, even when it causes problems in relationships.
G. Giving up important social, occupational, or recreational activities because of substance use.

H. Using substances again and again, even when it puts you in danger.
I. Continuing to use, even when you know you have a physical or psychological problem that could have been caused or made worse by the substance.
J. Needing more of the substance to get the effect you want (tolerance).
K. Development of withdrawal symptoms, which can be relieved by taking more of the substance.

Mild substance use disorder is defined as having two or three symptoms, moderate, four or five symptoms, and severe, six or more symptoms. Research notes that use of any amount of alcohol or other drugs following a brain injury is not recommended due to the complications it creates, including:

- People use alcohol or other drugs after they have a TBI do not recover as much.
- People will note an exacerbation of existing problems with balance, walking, or talking.
- People may experience additional problems with concentration and/or memory.
- People experience a more powerful effect from the substance.
- People may note an increase in impulsivity including saying and doing things without thinking first.
- It can cause seizure.
- It can increase your risk of an additional head injury.

Source: *https://wexnermedical.osu.edu/-/media/files/wexnermedical/patient-care/healthcare-services/neurological-institute/departments-and-centers/research-centers/ohio-valley/for-professionals/substance-abuse-and-tbi/the-effects-of-substance-use-and-tbi.pdf?la=en&hash=05C182391D3598054E98DA190DD1409C86CB2080*

Addiction: The American Society of Addiction Medicine (ASAM)[27] definition goes beyond the behavior associated with substance use disorders to consider interacting causal factors.

"Addiction is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. People with an addiction use substances, or engage in behaviors that become compulsive, that often continue despite consequence. Prevention efforts and treatment approaches for addiction are generally as successful as those for other chronic diseases." ASAM, 2019

Measuring the Severity of TBI

The main measurement of TBI severity is the degree of disruption of brain functioning that is observed or experienced at the time of injury. While there are some exceptions to this general rule, it is usually true that the length of time a person is unconscious or experiencing confusion and disorientation after an injury is directly related to injury severity. The period of loss of consciousness refers to how long a person is not responsive. The period of post-traumatic amnesia or confusion refers to the period of time that a person is disoriented after injury.

INJURY SEVERITY			
CRITERIA	**MILD**	**MODERATE**	**SEVERE**
STRUCTURAL IMAGING (MRI OR CT)	**Normal**	**Normal or Abnormal**	**Normal or Abnormal**
LOSS OF CONSCIOUSNESS	**<30 minutes**	**30 minutes to 24 hours**	**>24 hours**
POST-TRAUMATIC AMNESIA/ CONFUSION	**0-1 day**	**1-7 days**	**>7 days**

Modified from: *Brasure, M., Lamberty, G.J., Sayer, N.A., Nelson, N.W., Macdonald, R., Ouellette, J., ... Wilt, T.J. (2012). Multidisciplinary post-acute rehabilitation for moderate to severe traumatic brain injury in adults. Agency for Healthcare Research and Quality (AHRQ) Comparative Effectiveness Reviews, 72, ES1–ES20. Available at: http://effectivehealthcare.ahrq.gov/ehc/products/283/1141/CER72_TBIPostacute_FinalReport_20120725.pdf*

The Fingerprint of TBIs

The pattern of TBIs is not random. Because of the anatomy of the skull and how most traumatic injuries occur, TBIs tend to have the greatest impact on the structures of the prefrontal cortex and the temporal lobes. The inside of the skull has bony structures designed to hold the brain in place. When the force is great enough, rubbing up against these structures can cause damage to the surface of the brain and can also result in axonal shearing. For these reasons, TBIs will tend to have a pattern of disconnection that has its greatest effect on the connections from the prefrontal cortex (executive functioning) and the limbic system (emotional centers) that make up the reward circuit. These are the brain structures that are responsible for focusing attention and regulating emotion and behavior; they mediate how a person responds to reward. When connections between these areas are working well, judgments about risks and rewards are experienced as a gut feeling about the right thing to do. Focusing on a conversation in a noisy room, reading others' nonverbal behavior, keeping a lid on strong emotion, or remembering the good feelings that come with a success are automatic when connections in the brain are working. When these connections are disrupted as the result of TBI, these essential functions require conscious effort and become inefficient.

The reward circuit relies heavily on dopamine as a neurotransmitter. It is the reward where most substances of abuse exert their effects. As discussed below, the ongoing use of some substances of abuse alters the functioning of the reward system, making people more sensitive to immediate reward and less sensitive to punishing events. This same pattern is often observed after a TBI and results in behavioral impulsivity.

Brain Injuries and Overdose

An overdose can cause a brain injury, and having one overdose puts a person at risk for more.[25] People who are living with cognitive impairment are more prone to overdoses. They may have more difficulty monitoring their intake of a drug. It is also possible that changes in brain function may cause some drugs to have a more powerful effect.[28]

In overdose, the leading cause of damage to the brain is loss of oxygen. When loss of oxygen occurs for longer than 5 to 6 minutes, changes in brain chemistry occur that result in the destruction of neurons. Because the structures responsible for memory (the hippocampus) and movement (the cerebellum) use a lot of oxygen, these structures are among the first to show damage. The longer the loss of consciousness, the more tissue may be damaged or destroyed. Frequent overdoses with limited time for the brain to recover may result in increased damage. The symptoms of anoxic brain injury commonly impact executive functioning, memory, and attention, as well as movement.

Toxic Effects of Substance Use

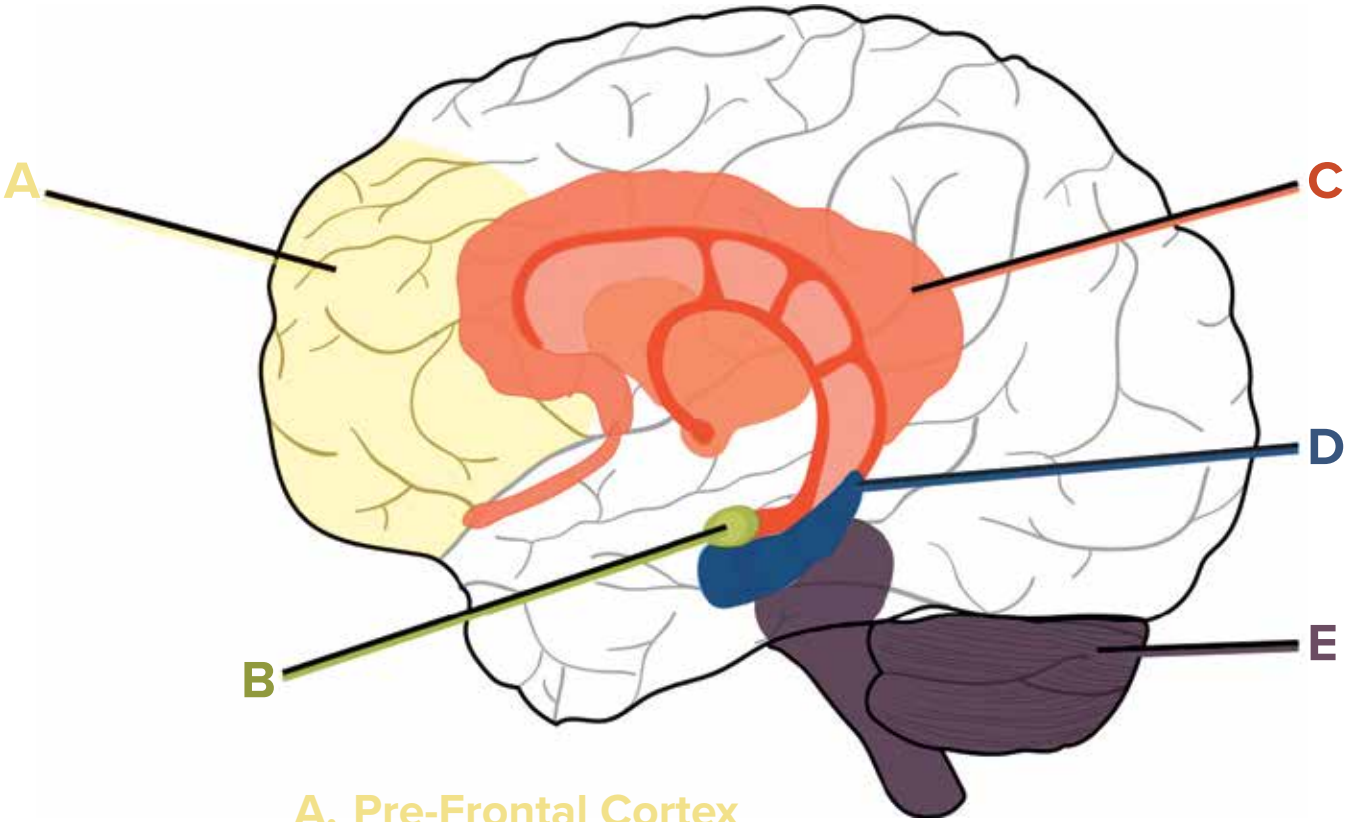
The impact of substance use depends on the substance used and the amount and duration of use. The age when substance use started is also an important factor. Starting substance use while the brain is developing can have long-term consequences.[29] Although the findings from the research are complex and sometimes contradictory, the most common difficulties associated with substances of all kind include problems with memory, attention, and executive functioning, including problem-solving, goal setting, and planning.

The table below provides a broad summary of the effects of common substances of abuse. Although more research is needed, it appears that the toxic effects of alcohol and other drugs are more dramatic in people who have had a history of brain injury.

SUBSTANCE	NEUROLOGICAL EFFECTS	COGNITIVE EFFECTS
ALCOHOL[30, 31]	• Associated with brain atrophy, particularly the Hippocampus (memory system). • Thiamine deficiency may cause a severe short-lived condition (Wernicke's encephalopathy) or result in lasting learning and memory problems (Korsakoff's syndrome).	Memory Executive Functioning: • Visual-Spatial abilities.
CANNABIS[32]	• Some evidence for atrophy in the Hippocampus (memory system) and changes in connectivity between the frontal lobes and limbic system. • May have a greater impact on the developing brain.	Memory Executive Functioning.
METHAMPHETAMINE[33, 34]	• Widespread damage to dopamine receptors, with cell loss in the emotion and reward system (limbic system), and Hippocampus (memory system).[56]	Memory Executive Functioning: • Inability to suppress habitual behaviors. • Sensitivity to short-term reward. • Insensitivity to punishment. • Insensitivity to normal pleasures.
COCAINE[35]	• Weakened connections between the frontal lobe and limbic system (frontostriatal) connections, brain atrophy, and changes in limbic (emotional) and Hippocampus (memory system).	Memory Executive Functioning: • Sensitivity to short-term rewards. • Insensitivity to normal pleasures. • Increased sensitivity to pain.
OPIOIDS[36]	• Weakened connections between the frontal lobe and limbic system (frontostriatal) connections, brain atrophy, and changes in limbic (emotional) and Hippocampus (memory system).	Memory Executive Functioning: • Sensitivity to short-term rewards. • Insensitivity to normal pleasures. • Increased sensitivity to pain.

The resource section of this manual includes resources to learn more about the impact of commonly used substances.

Brain and relationship to behavior below:



A. Pre-Frontal Cortex

- Executive Functions
- Focusing, Reasoning, Rationalizing

B. Amygdala

- Drives: Hunger, Sex, and Anger

C. Limbic System

- Controls Emotions, Memories, and Habits
- Motivation

D. Hippocampus

- Learning and Memory

E. Brain-Stem and Cerebellum

- Fight or Flight (Auto-Pilot)

SYMPTOMS ASSOCIATED WITH BRAIN INJURY

CATEGORY	SYMPTOMS	
MOTOR AND SENSORY EFFECTS	• Dizziness, lightheadedness, or vertigo. • Fatigue or lethargy. • Changes in walking and coordination. • Headaches and other pain symptoms.	• Sensory impairments (e.g., blurred vision, sensitivity to light and sound, ringing in ears). • Sleep disturbances. • Weakness.
COGNITIVE IMPAIRMENT	• Cognitive slowing (i.e., inability to process information efficiently). • Memory impairment (i.e., inability to remember what has happened in the past). • Impaired attention and concentration (i.e., knowing what to do in the present). • Difficulty multitasking. • Impairments of language and communication.	• Executive dysfunction (organization, planning, judgment, reasoning, initiation). • Impaired self-monitoring (insight and awareness). • Inability to problem-solve and develop new solutions. • Problems with generalizing strategies from one setting to another.
EMOTION AND BEHAVIORAL DYSREGULATION	• Increased likelihood of concurrent mental health issues (e.g., anxiety). • Increased likelihood of behavioral problems (e.g., anger, irritability, socially inappropriate behavior).	• Increased likelihood of impulsivity. • Increased sensitivity to environmental stimuli. • Lack of initiation. • Difficulty learning from experience.

Sources: *American Psychiatric Association, 2013; Lux, 2007;*[37] *National Institute of Neurological Disorders and Stroke, 2002, Ohio Valley Center for Brain Injury Prevention and Rehabilitation, 1994*

How the emotional and behavioral impact of executive impairments can affect participation in treatment

Cognitive problems (problems with attention, memory, and problem-solving) can contribute to problematic substance use and make the intervention more difficult. However, problems with emotional and behavioral dysregulation are often more difficult to recognize and, in many cases, create the greatest challenges for individuals with TBI. Many individuals with TBI find sensory and emotional inputs more difficult to manage, resulting in mood and behavior changes. These changes are often described as “a change in personality.”

People living with brain injury often have a bigger gap between what they intend to do and what they can do. The ability to manage emotions (through both automatic brain processing and conscious thought) allows us to get organized to meet goals, get started on activities, monitor what is happening, and switch tasks or strategies when needed. A well-defined set of neuronal circuits between the prefrontal cortex (responsible for planning and reasoning) and the limbic system (responsible for emotions) are designed to ensure that we can adapt to changing situations and keep our behavior on course despite distractions. Problems with behavior and mood occur when the emotional system gets out of balance with the reasoning and planning system.

Efficient cognitive processing relies on healthy connections between brain structures. Most brain processes occur without our conscious effort. Our brains evolved to be as efficient as possible. Conscious thought is relatively slow and uses up a lot of brain energy. To be as efficient as possible, evolution has designed our brains to determine which behaviors are most successful and then set up habits that do not require much conscious thought–like an autopilot. One example of this phenomenon is learning a complex skill like driving a car. In the beginning, it takes all our conscious effort to control the gas and the brakes, judge where we are in the traffic lane, etc. However, as we become more experienced drivers, we may find ourselves thinking about something while driving and may arrive safely without much conscious awareness of all of the steps of driving a vehicle.

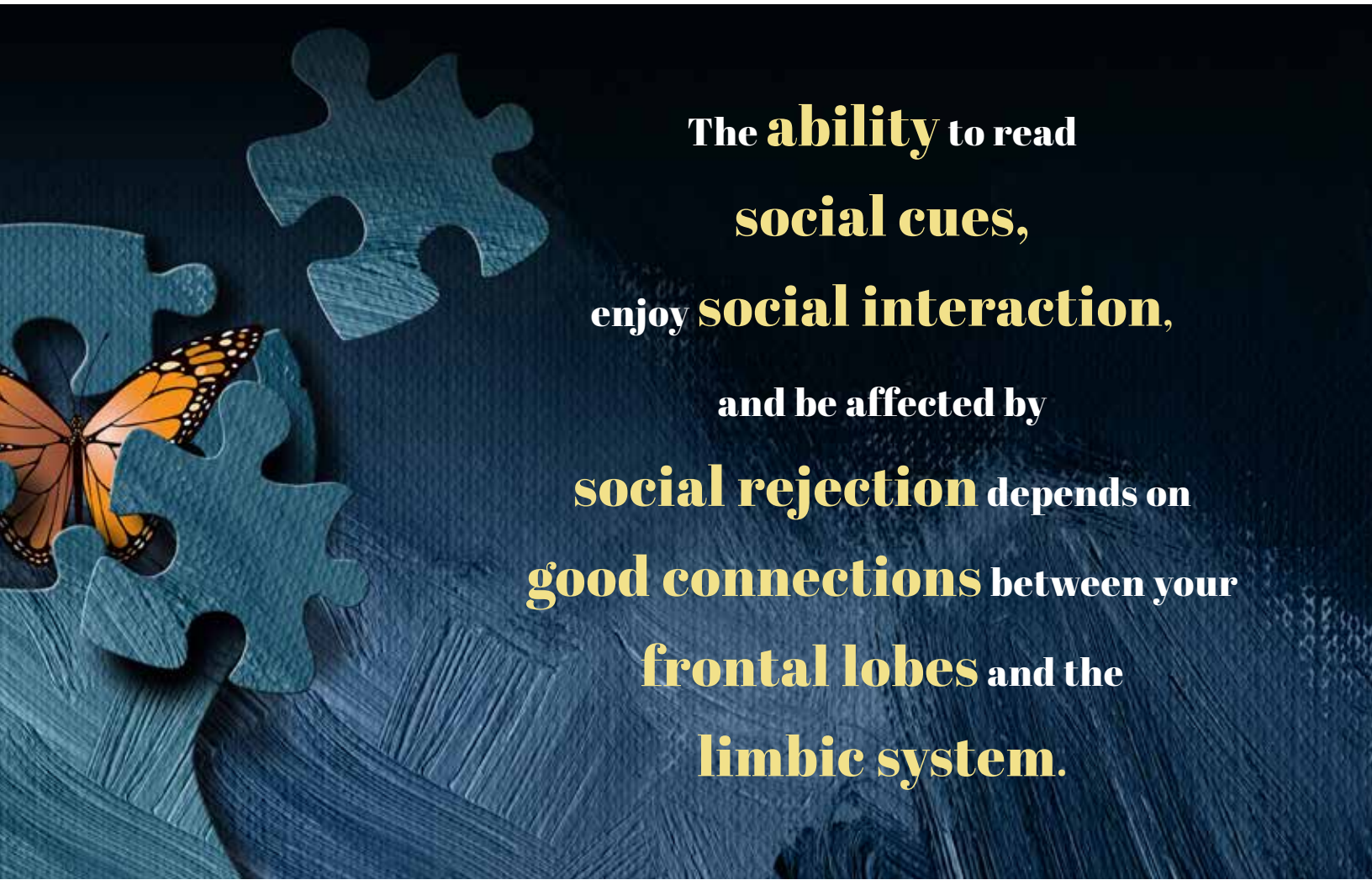
When it functions well, the brain can sort through sensory inputs and direct our attention to what is most important, like picking out a conversation in a noisy room or tuning into others' social cues. To get our needs met, the healthy brain's reward system chooses habits that result in a feeling of reward. The feeling of reward comes from the release of dopamine in the reward circuit. Most of the time, behavior or experiences that result in the release of dopamine are good for us, but it is not a perfect system. At the best of times, human beings may find it difficult to alter habits that are no longer useful. But when the immediate rewards are high, and the problems associated with the behavior occur over the long term, behavior changing habits become more difficult. Overriding the automatic behaviors requires a well-connected brain and strong executive functioning. Addiction is an example of when the reward system is led astray, and the conscious-control systems may have less influence over behavior. Impulsivity exists, undermining their emotions in the moment and neglecting longer-term goals. This is a problem that researchers have labeled delay discounting. Behaviors associated with delay discounting can be frustrating for both the client and the provider.

In a quiet, distraction-free environment and in the presence of a caring and empathetic provider, a person may show good insight and a genuine intention to work toward a goal. They may be able to make realistic suggestions and seem to be good planners. Their emotional state is calm, and their frontal lobes are at their best. Outside of the session, where there are distractions, temptations, and stressful circumstances, it takes a very well-functioning executive system to override the strong emotions that may arise and to resist temptations. There is evidence that substances such as opioids and alcohol alter a person's ability to process rewards effectively over time.[38] TBIs may also disrupt the systems that allow the brain to override emotion, creating a new problem or worsening a problem associated with brain changes due to long-term substance use. To respond in a consistent way when under stress, the brain must have the capacity to moderate the signals coming from the emotional centers in the brain.

Signs of difficulty associated with impaired functioning of the prefrontal cortex include:

1. Poor follow-through with goals and intended behavior.
2. Failure to learn through experience.
3. Difficulty setting realistic goals.
4. Trouble recognizing how their behavior affects outcomes.

Difficulty reading others' social cues may occur after TBI. The ability to read social cues, enjoy social interaction, and be affected by social rejection depends on good connections between your frontal lobes and the limbic system. Reading and responding to social cues is usually so ingrained in us as adults, we are often not aware we are doing it. We walk into a room and feel a "vibe," and we understand when an interaction will be welcome and when it might not be. Each of these subtle cognitive abilities relies on the brain to focus its attention, take in the information, and interpret it properly. Very often a TBI (as well as some substances such as opioids) interferes with the process of reading and responding to social cues. For example, difficulty reading facial expressions may lead one to misread a neutral face as anger, miss the subtle signs of disgust that an interaction is not going well, or fail to respond to greetings. In addition, difficulty reading social cues may complicate the process of developing rapport with a therapist or working in group settings.



Brain Injury Recovery and Outcome

Signs that there are difficulties with social cognition include:

1. Difficulty taking turns in conversations
2. Appears to lack empathy
3. Is overly friendly
4. Defensive (assumes others are angry)
5. Isolates from group
6. Is overly sensitive
7. Lacks a sense of humor (unable to understand sarcasm)
8. Is gullible

Difficulties with emotional regulation are the result of impairments of frontal subcortical circuits. When moderated, emotional regulation rises and falls according to the seriousness of a situation and is influenced by an individual's thoughts and behaviors in a predictable way. People who have dysregulated emotions may have very strong emotional responses that can be triggered by something that may seem trivial to others. As a result, they may keep returning to an event or a type of emotion, unable to work things through or let them go.

Shallow or volatile emotional states may occur. For example, an individual may have an outburst of angry behavior. After the episode is ended, they may return to a calm and friendly state and have difficulty recognizing why others may still have a strong emotional response. Emotional flooding may occur. Flooding occurs when an individual is easily overwhelmed and seems to shut down or freeze when an emotionally difficult situation arises. This is a natural response that may occur at a much lower threshold or last longer in the individual who is having difficulty regulating their emotions.

Signs of poor emotional regulation include:

1. Sudden shifts in mood (from calm to upset and back again).
2. Client describes a sudden onset of mood ("I go from 0 to 10").
3. Seems to "check out" or appears bored when emotional situations arise.
4. Strong tendency to return to emotionally upsetting events.

How well a person recovers from TBI is related, in part, to the severity of the head injury. However, there is a great deal of variation from person to person. The timeline for recovery also varies with the severity of the injury. It tends to be fastest initially and then gradually plateaus. It is important to know that improvements can continue to happen for many years after a TBI. Still, once a plateau in progress is experienced, progress requires re-learning and practice, and changes are likely to be very gradual.

Mechanisms of recovery from TBI:

- The recovery of brain chemistry to a more normal state includes:
- Swelling goes down and allows neurons to go back to normal
- Neurons reconnect
- Neuroplasticity (new connections forming between undamaged neurons)

Mild TBI (Concussion): 70 to 85% of people who experience a mild TBI will recover fully within days to weeks or months. Most mild TBIs have no findings on neuroimaging. However, in some cases, there may be minor findings. Roughly 15% of people have some ongoing symptoms after a mild TBI, including vision changes, sensitivity to light and noise, headaches, fatigue, and difficulty with memory, and concentration.

Moderate TBI: Moderate TBI often requires a hospital stay and may result in lasting problems. People sustaining moderate injuries can usually return to many of their regular activities. The course of recovery for moderate TBI is generally longer than that for mild injuries. The most rapid changes occur in the months following injury, with noticeable changes occurring up to a year or two post-injury. Improvements may continue indefinitely but at a slower pace.

Severe TBI: People who have sustained a severe TBI have generally had a hospital stay and generally experience lasting effects that impact their daily lives. The period of greatest recovery after severe TBI lasts a year or two. Although changes in brain functioning may occur indefinitely, functional improvements in the later stages of recovery are often due to learning how to compensate for the problems caused by the injury.

Risk Factors for Greater Disability after TBI:

- **History of Previous Injury.** The higher the number of injuries sustained, and the more recent the injuries are, the greater the risk for lasting effects. Multiple mild concussions or injuries resulting from falls, domestic violence, or sports can result in lasting changes in functioning—even though the individual experiences few symptoms.
- **Assault and Abuse.** Injuries sustained as the result of physical violence often have poorer outcomes.
- **Childhood Injury.** Sustaining an injury in childhood during vulnerable periods of brain development can increase the risk for problems after brain injury. Symptoms of childhood brain injuries may unfold as expectations for development and behavior increase.
- **Older Age at Injury.** This may create a risk for slower or less complete recovery.
- **Pre-Injury Mental Health Problems.** This includes depression, anxiety, and substance use disorders: may face difficult and protracted periods of recovery.
- **Post-Traumatic Stress Disorder (PTSD).** This results in changes in emotional regulation as well as cognitive changes. When PTSD occurs with a brain injury, there is a much greater risk of lasting problems.
- **Social Supports and Access to Healthcare.** People who have limited access to healthcare and social supports do not recover as well from a TBI. Social supports include access to income, education, employment, safe working conditions, early childhood development supports, and access to necessities such as food, clothing, and shelter. Access to healthcare and social supports is influenced by race, with notably poorer outcomes for people of color.

SECTION 2

SCREENING FOR BRAIN INJURY

SCREENING FOR BRAIN INJURY

Unless a client had a severe injury and is aware of the resulting difficulties, you may not know about a client's history of brain injury before their first visit with you. A client you are serving may not be aware of their personal history of brain injury and how it is impacting their current functioning. If they are aware, they might not realize its relevant to other concerns and might not think to mention it. This is particularly true when an individual sustained their injuries in the context of intimate partner violence (IPV) or abuse. Use screening questions that are specific, and provide your client with cues about how to think about their own history to provide the information you need to determine if care adaptations may be required.

Any clinician who has taken the time to learn how to use a screening measure and interpret the results can screen for brain injury. Some clinicians express the concern that they should not screen for a problem when they do not have the knowledge or resources for intervention. There are many skills you can incorporate to ensure the intervention you are delivering is more effective. Screening is critical. However, it is important to recognize that screening is not a diagnosis. A positive screen gives us some clues that could help to explain our clinical observations and suggest measures that might be taken to improve their situation. For example, when someone reports a history of brain injury to you, they provide information that you can use to formulate a care plan that considers the risk of suicide. Adolescents and adults who have sustained a TBI are at a significantly increased risk of suicidal ideation, acts, and attempts.[15]

Who Should Be Screened for Brain Injury?

The answer is simple: Everyone you serve. As we discussed in the introduction to this toolkit, brain injury often comes with invisible disabilities. Depending on the setting, there may be a high risk of brain injury in the people you serve.

When Should Screening Occur?

The timing of screening for brain injury will depend on the setting you work in and the clients you serve. Questions pertaining to a history of illness or injury affecting the head or brain can be included in intake questionnaires. The best practice is to follow-up with an interview to ensure that the client has understood, remembered, and reported all the important events and information. There are also some important considerations to minimize the possible negative impact of screening.

Managing Stigma. While it is very important to screen for brain injury, it is also important to be sensitive to the potential for clients to feel stigmatized by the discussion. It is common for people who have a history of brain injury to feel that others see them as "dumb" or "damaged." It is important to consider how you, as a clinician, must elicit the history in a respectful manner. **The importance of recognizing and affirming a client's individual's resilience, abilities, and strengths throughout this discussion is critical.** It is also important to recognize and reinforce that having a problem with memory, attention, cognitive slowing, or communication does not mean that a person is unable to make decisions for themselves or make important contributions to others. What it does mean, though, is that understanding these difficulties and compensating for them will allow a person to have more impact. They will, then, be able to make the best possible decisions for themselves and be better understood and more in control.

Trauma-Informed Care. For many people, talking about their medical history and, in particular, any injuries to their head or brain may elicit traumatic memories. Before asking direct questions about brain injury, screening for a history of trauma will help avoid unexpected and negative reactions to the assessment. Even with screening, however, a client may have an emotional reaction to being asked about their history of injury. This is particularly true if their injury occurred under traumatic circumstances. The clinician will need to use their judgment regarding the timing of a screening interview and how far to pursue specific information if a client appears distressed.

Clients who may have sustained an injury in the context of intimate partner violence or other trauma may feel more comfortable and, therefore, provide more complete reports on questionnaires that they can complete privately rather than in interviews.[39] Screening tools may need to be modified slightly to include questions related to near strangulation. If you are working in an addiction setting, you may want to ask about overdose episodes explicitly.

Screening Methods

Screening measures that use only one or two questions to determine whether a brain injury has occurred have been found to miss milder and more remote histories of brain injury.[40] For this reason, researchers have developed screening measures that provide the individual with a clear set of cues to help them think back on their own history and provide responses that indicate when the injury happened and how severe it was. Although self-reporting is not perfect, it can provide a reasonable estimate of an individual's exposure to brain injury over the course of their lifetime. An experienced interviewer may be able to complete this screening in as little as just a few minutes for an uncomplicated history, or up to 15 minutes if there is a substantial brain injury history.

Suggested Screening Tools:

The Ohio State University Traumatic Brain Injury Identification Method (OSU TBI-ID)

The OSU TBI-ID[41] uses a set of specific cues to help interviewees remember their lifetime history of TBI. This screening tool is recommended because it has been shown to be a reliable way to elicit TBI history and includes guidelines for clinical interpretation of the findings. The OSU TBI-ID can be administered by anyone who has completed training. Free training to administer the OSU TBI-ID method is available online at http://www.brainline.org/content/2013/08/new-tbi-screening-tool.html and http://ohiovalley.org/tbi-id-method and takes less than one hour to complete. Because of the research evidence that the OSU TBI-ID method elicits a complete and reliable estimate of TBI history, this measure is recommended.

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 mild TBIs 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

Adapted with permission from the Ohio State University TBI Identification Method (Corrigan, J.D., Bogner, J.A. (2007). Initial reliability and validity of the OSU TBI Identification Method. J Head Trauma Rehabil, 22(6):318-329.
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The screening method includes detailed questions, listing possible ways that an injury may occur. The interviewer/clinician notes each possible injury and the age at which it occurred. Once all injuries are listed, the interviewer returns to each injury and asks a series of questions to determine the severity of the injury. Often several blows to the head occur frequently during a period of time. For example, a young athlete might have had a number of hard hits while playing football. Someone living

with an abusive partner may report a period of time when they sustained hits to their head. In that case, the client is asked to talk about the worst of the injuries they sustained, and the period of frequent injury is noted on the form.

Quick Screening for Lifetime History of TBI from the OSU TBI-ID

If your agency/employer wants to have screening completed during the intake process or in a setting in which a 10-minute interview with a trained provider is impractical, a brief screening form is useful.

A brief form for self-screening was developed by the creators of the original OSU TBI-ID. These questions allow the three results of screening to be computed:

- Positive for a lifetime history for TBI with loss of consciousness (LOC) (yes/no);
- Worst TBI with LOC was mild, moderate, or severe (no TBI with LOC, mild TBI with LOC, moderate TBI, severe TBI);
- Age at which first TBI with LOC occurred (in years). This measure does not get information about aftereffects of injury, and the interested clinician would need to follow up on that independently.

OSU TBI-ID Quick Screen

Please think about injuries you have had over your entire lifetime, especially those that affected your head or neck. It might help to remember times you went to the hospital or emergency room. Think about injuries you may have received from a car or motorcycle wreck, bicycle crash, being hit by something, falling, being hit by someone, playing sports, or during military service.

a. Thinking about any injuries you have had in your lifetime, were you ever knocked out, or did you lose consciousness?
   _____ Yes
   _____ No (IF NO, STOP HERE)

b. What was the longest time you were knocked out or unconscious? (Choose just one; if you are not sure, please make your best guess.)
   _____ knocked out or lost consciousness for less than 30 minutes
   _____ knocked out or lost consciousness for between 30 minutes and 24 hours
   _____ knocked out or lost consciousness for 24 hours or longer

c. How old were you the first time you were knocked out or lost consciousness?
   _____ years old

Understanding the Results of Screening

Not all hits to the head result in a concussion or brain injury. Remember that the vast majority of brain injuries are mild, and most people with mild injuries recover within the first few months of injury. Even when people have had a couple of concussions in their lifetime, they may not have any lasting effects if they've had enough time to heal between injuries.

When a person reports a brain injury that included a loss of consciousness that lasted 30 minutes, or they remained confused for more than 24 hours, there's more reason to be concerned that they are living with some lasting problems from their injury.

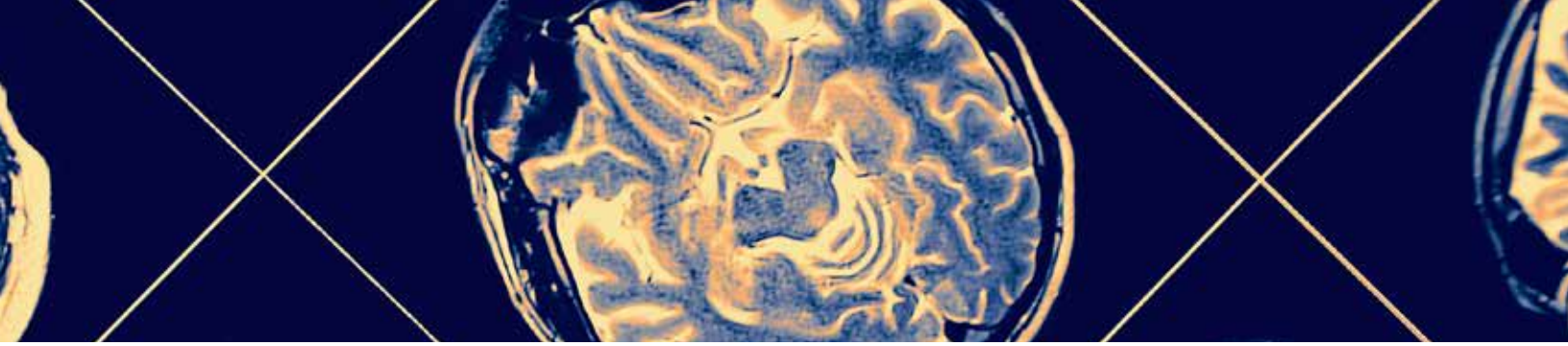
Suppose a person suffers an injury with a loss of consciousness of any length before the age of fifteen. They are at risk for problems with emotional regulation and behavior, depending on the severity of the injury.

> Suppose a person has had a number of injuries, particularly if they are spaced closely enough together that a second injury occurs while the first is still healing. In that case, there is reason to be concerned about lasting impacts.
>
> People with injuries that occurred within a few months' time (if they were mild) or within the first year or two (if they were more severe) are more likely to be experiencing symptoms related to their TBI.

When brain injuries occur with other health or behavioral health concerns, they are more likely to have lasting effects. Mental health problems such as depressed mood and anxiety may be made worse by a brain injury. People who have serious mental health problems, such as someone diagnosed with schizophrenia, may find that the injury exacerbates existing difficulties with thinking and memory or worsens some of their psychiatric symptoms.

Specialty Referrals

Ideally, when a history of brain injury is discovered and cognitive and functional impairments suspected, the client should be referred to a professional working in the field of rehabilitation familiar with brain injury for assessment and intervention or consultation. Cognitive assessment by a neuropsychologist can provide an understanding of an individual's particular strengths and weaknesses. Assessment by an occupational therapist may provide information about an individual's ability to meet the demands of daily living, enabling the therapist to provide practical recommendations for accommodating cognitive impairments and improving function. Evaluation by a neurologist may be required if there is a concern about ongoing neurological symptoms, such as episodes of loss of consciousness or a recent change in cognitive functioning. **In many cases, these specialized referrals are not readily available, and providers of substance use disorder treatment may need to make their own observations of a client's needs and abilities.**



Screening for Functional Impairments

Once you understand a client's history, you will need to have a clear picture of the client's current challenges. Often a clinician will need to assess a client's cognitive difficulties without the benefit of a formal psychological assessment. Typically, the goal of assessment is to identify what might be causing a given difficulty to determine the best treatment. In the case of co-occurring mental health issues and addictions and/or brain injury, it is generally impossible to determine precisely what is causing a given cognitive or behavioral problem. Many brain injury symptoms overlap with the cognitive and behavioral symptoms that are often observed as a direct result of substance use. Intoxication, as well as cognitive and behavioral changes that result from substance use, may closely resemble symptoms of brain injury. Complex histories that include adverse childhood experiences, recent traumatic events, and serious mental illness can also contribute to behavioral and cognitive difficulties. The best approach is to assess a client's current abilities and accommodate them.

Assessing the functional impact of cognitive impairment in the interview

The table on page 31 provides some sample questions that may help to identify cognitive impairment through direct questioning. Later sections will give suggestions on how to interpret your observation of a client's behavior during the intervention. Many clinicians may find it awkward to speak to someone directly about their disability or cognitive impairments. A clinician should open this discussion with a statement that indicates that the purpose of the questioning is to better address their needs.

As you discuss a client's history, it is important to note whether the client has experienced any significant problems in activities of daily living that have resulted from the disability. This will help you understand the types of accommodations they may require. Programs for treating substance use disorders often include assessment of activities of daily living along with life-skills training. In the event your program does not have this type of assessment as a part of the intake process, one option is to use the World Health Organization Disability Assessment Scale (WHODAS 2.0 Screening Tool), which is available for clinical use without cost.

WHODAS 2.0 Screening Tool
For some client groups, it will be useful to have an overview of a client's disability in terms of their capacity to complete day-to-day activities. The World Health Organization's Tool covers six domains of functioning: cognition, mobility, self-care, getting along with others, life activities, and participation. This tool is designed to be useful across disability groups, including mental, neurological, and substance use disorders. It is relatively short and easily administered (it takes 5 to 20 minutes to complete) and has been found to be relevant across cultures.

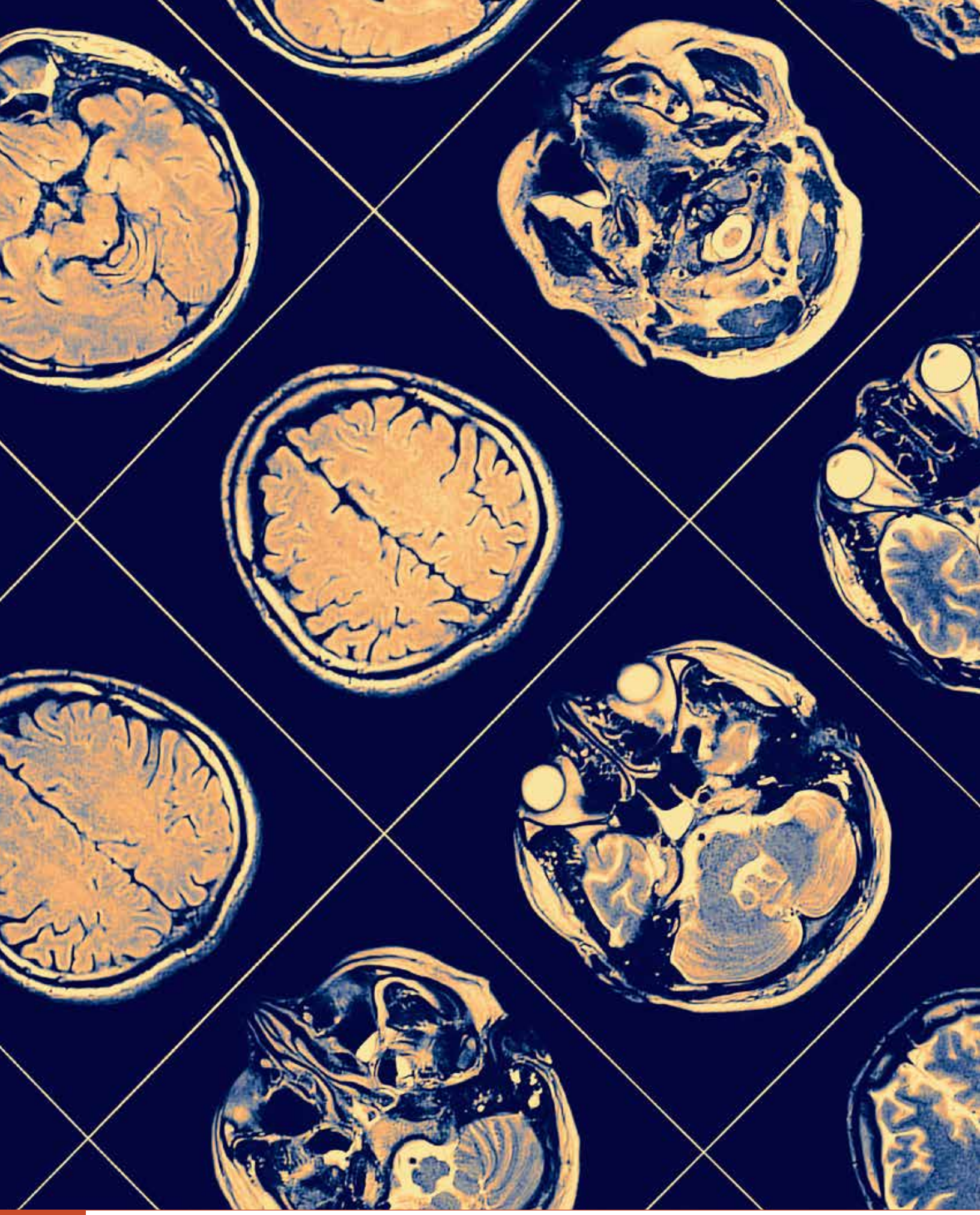
The format of the questions is like the table on page 31 but pertains to each of the six different functional areas. A detailed manual provides information about the interview administration as well as scoring. The manual, as well as an overview of the psychometric characteristics of the measure, can be found at: https://www.who.int/classifications/icf/more_whodas/en/.

Cognitive Screening
Screening for cognitive impairment at the start of treatment can include a cognitive screening measure that directly assesses cognition. Cognitive screening has the benefit of providing a measure of abilities at the time the assessment was conducted. It can be a window into the types of problems a person is having with thinking, and scores can be used to track the changes in cognitive abilities that may be occurring as the result of recovery. In most cases, the cognitive screening will not pick up on the behavioral aspects of brain injury-related impairments. Observations of day-to-day difficulties will still be needed to develop appropriate accommodations.

Cognitive screening should be completed by an individual who has been trained in the use of the assessment instrument and understands how age, education, and effort during testing may directly impact the results observed on screening. The resource section of this manual includes links to measures that can be used to learn more about cognitive screening.

SYMPTOMS ASSOCIATED WITH BRAIN INJURY

ASK: *HAVE YOU EVER HAD DIFFICULTIES WITH...*	LISTEN FOR AND OBSERVE
Getting your point across to others?	Is speech clear? Do words come easily? Is the message organized and complete? Do verbal statements match nonverbal behavior?
Sitting still?	Are there specific times/places that are difficult? What is the client's experience with this at work, school, etc.? What does the client think causes the difficulty? What helps?
Focusing your attention?	How long has this been a problem? When is it best? When is it worse? What seems to help?
Understanding what others are saying?	• Knowledge of the language of service delivery • Ability to understand words in primary language • Ability to pay attention one-on-one; ability to pay attention in groups • Hearing one-on-one; hearing in groups
Communicating your thoughts and feelings?	• Recognizing feelings • Organizing thoughts
Managing your anger?	History of aggression: When is anger worse? When is anger least likely?
Remembering things?	Memory for information? Memory for events in the past? Memory for things to do in the future? When is it best? When is it worse? What does the client do about it?
Following instructions (verbal or written), e.g., directions to a location, for building something, for cooking something?	What kind of instructions are most difficult to follow? What kind of instructions are easiest to follow?
Becoming tired easily?	In which situations is fatigue occurring? What is the client's endurance for mental activity (e.g., education sessions, group therapy)? What is the client's endurance for physical activity (e.g., walking)? What helps?
Getting along with others?	• State of family relationships • State of friendships
Being impulsive — doing before thinking?	When is the client at their most impulsive? When is the client at their most organized and able to make plans?
Trouble getting thoughts out of your head?	Does the client have trouble letting go of angry or upsetting thoughts? Does the client have trouble with worrying?
Making up your mind?	What sort of decisions are easiest? What sort of decisions are most difficult?
Solving problems you haven't seen before?	Examples of problems that proved difficult: Is the client willing to seek assistance? Does the client try to solve a problem before seeking assistance?
Getting started on something you need or want to do?	Is the problem making plans? Is the problem remembering what needs to be done? Is the problem poor initiation (knowing what needs to be done but putting it off with little/no reason for doing so)?



SECTION 3

RECOGNIZING AND ACCOMMODATING THE COGNITIVE AND BEHAVIORAL IMPACT OF TBI

RECOGNIZING AND ACCOMMODATING THE COGNITIVE AND BEHAVIORAL IMPACT OF TBI

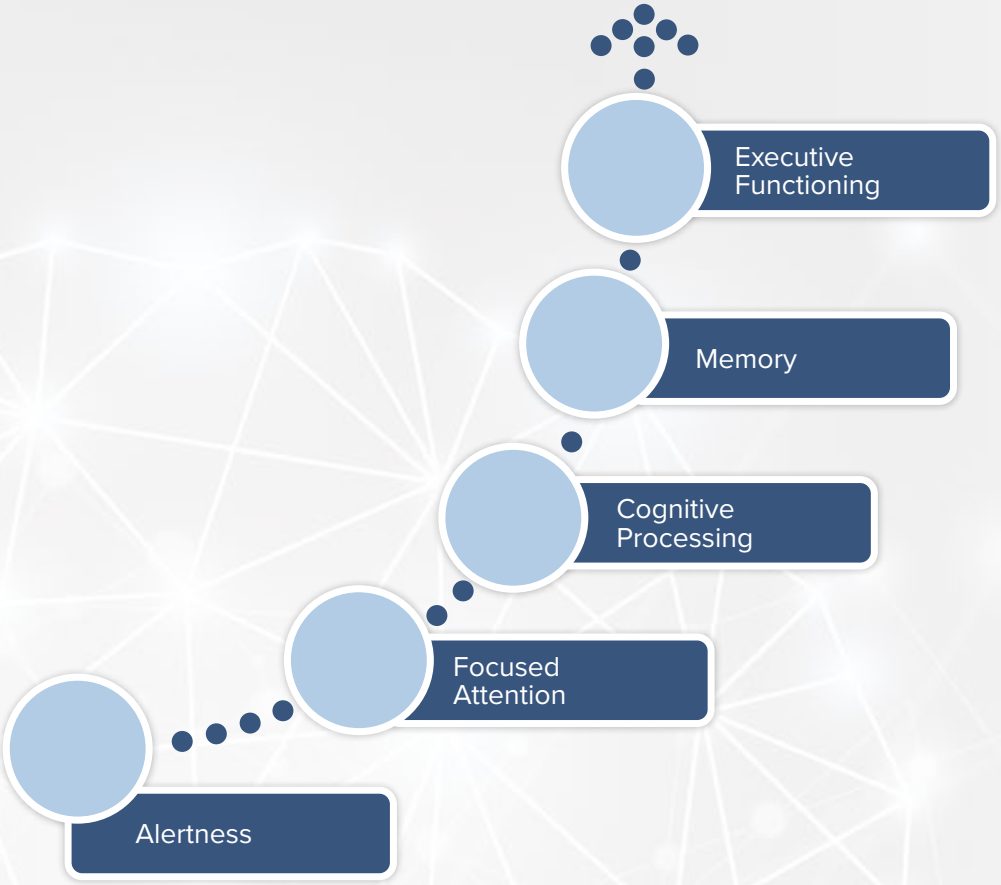
In this section, we will be providing information about different cognitive functions and how to recognize the problems your clients may be experiencing. Suggestions for managing the problems you observe are included in each section. These recommendations are not intended to replace intervention by experienced providers of TBI services. In the final section of this toolkit, we will be providing information related to integrating care and how to get more information about using cognitive compensation strategies. Where possible and practical, referral for TBI services, including cognitive rehabilitation is recommended.

Cognitive functions. These include memory, language, and attention, as well as visual-perceptual abilities and problem-solving or reasoning. As described in this toolkit, impairments of cognitive functions may require changing the manner in which treatment is offered to accommodate difficulties with understanding and remembering what is occurring in treatment.

Behavior (neurobehavioral) functions. Neurobehavioral functions refer to the group of functional abilities that guide our behavior. They enable us to interact socially, make decisions that are good for us in the long run, set goals, and pursue rewards. Neurobehavioral functions include processing emotional information and responding to rewards, both of which are essential in regulating our behavior. They also include energizing (initiating) behavior and self-awareness. These functions are addressed in the sections related to executive functioning and communication.

Recognizing and Accommodating Cognitive Impairments

The model on page 35 is one way to understand how neurocognitive and neurobehavioral functions of the brain work together to allow a person to think and interact with others effectively. This model should be read from the bottom up. Each of the functions builds on the ones below. At the most basic level, a person has to be awake and alert—to perform any cognitive process—***Alertness***. Once they are awake, they may be able to focus their ***Attention***. If they can focus, they can take in and understand information and use it—***Cognitive Processing***. Once information is processed, there is the potential for it to be remembered—***Memory***. Pulling all of these functions together to result in behavior that is productive are the ***Executive Functions***. Executive functions include starting something when it should be started—***Initiation***—***Planning***, and ***Organization***, avoiding impulsive behavior—***Inhibition***—***Mental Flexibility***, and ***Self-Awareness***.



The next section provides information about different aspects of neurocognitive problems along with suggestions for how to support clients with the difficulties you are observing. In each section, you will find a table that provides examples of strategies you can use. You will notice that the same strategies may be used for several different kinds of problems. At the end of the section, there is a list of general cognitive strategies that can be helpful in addressing the most common cognitive difficulties you will observe.

Problems with Alertness (Fatigue)

Fatigue, sleepiness, and hunger typically have a negative impact on cognitive performance and mood. However, this effect is often more pronounced for people living with the impact of acquired brain injury. Sometimes the problem is related to impaired functioning of the alerting attention system. When this is the case, a person may not appear alert or vigilant.

Another common problem is neuro-fatigue, which is the result of less-efficient processing of information, leading to increased cognitive effort. Reduced tolerance for busy/noisy environments and limited stamina, mental effort, and physical effort are common outcomes of neuro-fatigue. Consider that participation in group or individual treatment may require a client to attend to others' emotionally laden information, their own history, or information being provided. These activities require significant mental and emotional effort. Fatigue is easily mistaken for lack of interest or motivation when an individual seems to be "checking out" during a therapy session or group. This is particularly true for people who have difficulty with self-regulation.

Structures in the brain responsible for the regulation of sleep may be disrupted as the result of common sleep disorders, including disrupted sleep cycling and frequent awakenings. Poor sleep at night generally results in some degree of daytime sleepiness or fatigue. When a client is demonstrating daytime fatigue, they should be assessed for the presence of a sleep disorder.

When a person has problems with alertness, you may notice:

- Yawning and appearing sleepy
- Irritability in busy/noisy places
- Irritability that builds over the course of an activity or day
- Avoiding places that are busy or noisy

PROBLEM	EXAMPLES	WHAT TO DO
Appears sleepy/Tired	Rolanda often slumps in her chair. There have been times where her eyes close.	Ask Rolanda about fatigue and sleep. Determine if there's a better time of day. Some clients function best in the morning, others in the afternoon.
	Ellen seems to become less responsive after about a half-hour of talking. She looks "spaced out."	Determine Ellen's tolerance for activities. Schedule rests between appointments. Offer breaks.
Yawns	Sam yawns a lot.	Taking a quick walk with Sam may energize him and help him to attend the session. Be flexible with the length of sessions. Shorter, more frequent sessions may be helpful. Determine if hunger or irregular diet may be contributing to fatigue.
Appears irritable	Toby starts the session cheerful and can talk about important issues. Toward the end of the session, he seems to lose focus and snap at questions.	Provide respectful feedback: "Toby, I notice that, after about 30 minutes, you seem kind of irritated. This takes a lot of energy. I wonder if you're feeling tired now?" Support Toby in recognizing the impact of fatigue and in planning accordingly.
Reduced tolerance for noise/visual input	When the drop-in is busy, Jen can't sit still. She's always going up to the bathroom or out for a cigarette.	Provide a quiet space for Jen to rest or wait for sessions. Help Jen to recognize and compensate for the pattern.
	Andy appears excited and tense when he gets to the office on days when the waiting area is full of activity.	"Andy, I think that the noise here may be getting to you. What about taking a few minutes in the quiet here to reset before we get started."

How you can help with fatigue:

- Recognize the signs of fatigue, and support your client to see patterns in their own behavior.
- Provide quiet rest areas. Build in rest periods after mental and physical activity.
- Pace activities, and schedule the most challenging activities for when a person is at their best. This may include providing a reduced schedule for structured programs.
- Consider the possibility of a sleep disorder, and support appropriate medical assessment and intervention.
- Have nutritious snacks available to rule out hunger as a source of fatigue or irritability.
- Providing a period of moderate movement or exercise, such as walking, can improve alertness and support participation in the moment. Regular exercise may help to prevent fatigue.

Problems with Attention

Like a spotlight that focuses on a specific area of a stage, attention is a mental spotlight that highlights what most deserves our focus at a certain moment. Three cognitive networks, named to reflect their functioning, have been identified.[42] The first of these is the alerting system, which is responsible for vigilance, the feeling of readiness when looking out for something in the environment. The orienting system is responsible for selective attention. It gathers information from sensory systems and prioritizes them to allow focus on what is essential to the goal. The executive system allows conscious processing to allocate attention resources in the service of a particular goal. Functionally, people may have difficulty in sustaining their attention (e.g., listening to a lecture), selectively attending (e.g., picking out a conversation in a noisy place), switching attention (alternative focus between tasks), and divided attention (e.g., listening to the radio while walking down the street).

When a person has difficulty with attention, you may notice:

- Being easily distracted by irrelevant information or stimuli.
- Moving from task to task without completing things.
- Irritable when interrupted.
- A difficulty reading or watching TV or movies.
- A difficulty locating items.

What you can do to help with problems of attention:

- Make tasks more engaging by using visual cues and hands-on experiences.
- Reduce distractions (visual and auditory).
- Break down instructions into single steps.
- Present one idea at a time.
- Announce changes in topic or task.
- Directly cue your client about which aspects of a task or environment are most important.

PROBLEM	EXAMPLES	WHAT TO DO
Selective Attention (Difficulty filtering out distractions)	Gerry often looks over his provider's shoulder to see what is happening outside. Tom fiddles with his cell phone. Ellen tries to read papers on her provider's desk or looks through the bookshelf.	Be sure that you have your client's attention before giving information. Begin sessions by pointing out and removing potential distractions. "Gerry, It's hard for us to get down to work when there are distractions. I'll close the blinds so the dog walkers won't bother us." "Tom, you can put your things there, in the corner." "Ellen, I'm going to clear this off and give you a moment to look at the bookshelf so we can focus together more easily."
	Al has trouble recovering from a distraction.	Acknowledge a distraction when it occurs, and make a direct statement to get back on track. "Al, that was a noisy door slam. We were just talking about ... " If you're concerned about attention, ask clients to repeat what they have understood.
Sustained Attention (sticking with a task or conversation)	Allen seems to have trouble contributing to group discussions. He goes from topic to topic.	For each of your clients, send an agenda for the session. Write the agenda on a pad of paper visible to you and the client (or post it in front of a group). Point to it as a cue to refocus attention when necessary.
	Sam makes speeches that are much too long, with too much detail.	"Sam, we're talking about families. Did your story relate to that?"
	Rhonda goes from one topic to the next. First, she's talking about triggers and then, suddenly, her pet cat.	Acknowledge what Rhonda has said, and bring the discussion back to the session.
	Joe's comments are often irrelevant in groups.	"Joe, I'm glad to hear what you have to say, but the topic we're on now is family relationships. Do you have a comment about that?"
Switching Attention	Alan is often late to appointments because he is doing his puzzles in the waiting room and loses track of time.	Suggest that Alan use the alarm on his phone to remind him when to pack up and come upstairs.
	Sarin keeps talking about what happened on the weekend after he was asked about his goal for today.	Return to agenda-setting with Sarin. Clearly announce the change in topic. "Sarin, you are really wanting to talk about the weekend. Is that our most important topic today? Can we take a minute to make a decision about the best way to spend our time together?"

Problems with Processing Information

Processing information relies on good connections among brain structures. After brain injury, pathways between the brain's processing centers may be damaged, making the process of thinking much slower. This doesn't mean that a person is unable to understand something, but it may take them longer.

When a person is slow in processing information, you may notice:

- Getting a part (but not all) of what is being said.
- Taking a long time to answer questions.
- Appearing lazy.
- Showing signs of fatigue (zoning out, looking sleepy).

What you can do to help:

- Keep things simple. Present one idea at a time.
- Check in—have the person repeat what they understood to make sure you are on the same page.
- Slow down your speech, and make sure you give a client enough time to respond to questions.

PROBLEM	EXAMPLES	WHAT TO DO
Getting part of a message	Alex seems confused after discussions and sometimes doesn't remember all that we talked about.	Present one concept at a time to Alex. Wait for recognition before moving on. Write important concepts down on paper that are visible to Alex.
Delayed responding	Jon may continue to talk about something after the topic has changed.	Be sure to give Jon plenty of time to respond to questions. Be aware that he has likely missed the change in topic, and re-introduce the information.
	Sanjita just seems to be very quiet. Sometimes she doesn't answer at all.	Provide Sanjita with a cue, and give more time to respond. "Sanjita, we were talking about triggers. Did you have anything to add?"

Problems with Memory

It can be confusing to understand why our clients remember some information, but not all. We tend to think about memory as a single cognitive function. In fact, there are several memory systems. There is one memory system that helps you to remember events (Episodic Memory), another that helps you to remember physical skills (Procedural Memory), and still a third that helps to store and recall information (Semantic Memory). There is also a memory for faces. Contrary to what you may have seen in movies, it is extremely rare for people living with brain injury to forget their own identity (Autobiographical Memory). Another way to think about types of memory relates to how the information is perceived—by vision or by hearing.

Memory processes include encoding (processing information), storage (creating a location for keeping the memory), and retrieval (locating and recalling the memory). The most common types of memory failures people have after brain injury are in retrieving or remembering new information at the right time and determining whether they are things that have happened in the past or something they need to do in the future. Interestingly, the ability to learn procedures or habits (if they are practiced consistently and accurately) is often unaffected by brain injury—even when memory is very poor. What this means is that repetition is often very helpful for enabling a person with memory impairment to learn new information.

The memory systems are very closely tied to our reward system and our emotional system. We also learn best when there is a reward, and our memories are often more vivid when something has been distressing or frightening. These differences in memory systems can explain why a client has a great deal of difficulty remembering what happened in a session (Episodic Memory) but knows where to find the coffee (Procedural Memory learned by experience and motivating). It may also explain why a person can recall an argument or a frightening event but has trouble remembering the pleasant things that happened.

Remembering something depends on how well we paid attention to it, how well we processed (encoded) the information, and how well our memory system is working. In general, retrieving information without cues is more difficult than recognizing information previously seen.

- We all have selective memory. It is easier to remember things that are motivating.
- Information is easier to remember when it is organized as we are learning it.
- When a client's memory is poor, they may remember how something felt more vividly than what actually happened.
- Even when a client's memory is very poor, helping them to learn by using repetition and preventing mistakes makes it possible to develop new routines and skills.

When a client has poor memory, you may notice:

- Forgetting to do something that was intended
- Needing several repetitions of information or a new skill to learn it
- Being inconsistent in doing tasks
- Appearing confused
- Needing cues or hints to remember that something is happening
- Staying with a feeling (anger or sadness) and not knowing why, or creating a story (confabulating) to explain how they are feeling

What you can do to help:

- Encourage a client to use notes, signs, calendars, and smartphones.
- Repeat the correct information (avoid talking about or reviewing mistakes, because it may be hard to remember later which information was correct and which was incorrect).

PROBLEM	EXAMPLES	WHAT TO DO
Episodic Memory (Recalling information or events between sessions)	Clara can't answer an open-ended question such as: "Do you remember what we talked about last week?"	Provide cues. "Clara, last week you told me about your trip to Ottawa, and we discussed some of the issues you had. Do you remember?"
	Sam doesn't bring up an issue in his session unless his provider prompts him to do it.	"Sam, have you made any notes about important events this week? Your worker said something about a party."
Prospective Memory (Remembering to do something)	Connie doesn't complete homework even though she seems very interested in trying new strategies.	Treat failures to follow through as memory failures rather than a lack of motivation. "Connie, let's take some time to figure out the best way to remember your homework." Arrange reminders near people or items in the environment, such as alarms and signs. Use routines. Matching tasks with activities that regularly take place can act as a cue. For example, review therapy notes after dinner, or practice relaxation after setting your alarm clock. "Connie, would it help to put a sign on the TV to do your meditation before you go to sleep?"
	Alex misses appointments even when you give him an appointment card.	Encourage the use of a date book or therapy notebook. Simple systems work best. Problem-solve with the client directly: "Alex, what can we do to help you to remember your appointments? Is there someone to remind you?" "We always have our appointments on Mondays after lunch. Would an appointment reminder in the morning help you to get here? Who can help you to remember?"
	Brady regularly leaves things behind in your office.	Make a routine of placing items in a specific place and getting them at the end of a session. "Brady, your bag is on the chair, where you left it. Do you have everything?"

- Organize important information by introducing topics and providing summaries.
- Give a client time to learn to use (and make routine) compensation strategies. A client may need reminders to look at calendars and phones.
- Make activities routine, and practice the routines until they are learned. Doing the same thing, in the same way, makes it easier to remember the steps in a process.
- Link new tasks with existing routines (e.g., taking medication before brushing teeth).

PROBLEM	EXAMPLES	WHAT TO DO
Selective Memory Remembering information that is very motivating or associated with strong emotion, while other information is forgotten. This is true for all of us but is exaggerated for people with brain injuries. Information that has a strong emotion associated with it, like anger or fear, is more accessible than information that has less emotional impact. The same is true for information that is very interesting or holds the promise of a reward. Because these effects are magnified in persons with memory loss, it can be very important to relate information to what the client finds interesting. Realize that they often have little control over the type of information that they recall best.	Natasha has a hard time understanding her triggers.	Information is easier to remember when it is organized. Using acronyms or organizers can be helpful. Take time to develop or review an organizer for important information. "Natasha, we could use HALT—Hungry, Angry, Lonely, Tired—to remember possible triggers. We can write that on a card, and you can say 'HALT' ... stop and think."
	Jim forgets to bring his notebook to sessions.	"Jim, perhaps you can leave your notebook with your keys by the door or make a reminder sign to put on your door."
	Andrea has trouble remembering decisions that she has made.	"Andrea, that was an important idea. Should we think of a place that you could write it down so it will stay front of mind? We can write a note, and you can take a picture. Where would you like to put that so you'll see it this week?"
	Ben always seems to focus on things that make him upset or angry. He rarely brings up good things.	"Ben, I think you need some extra help remembering what does work. It's too easy to remember the bad stuff. Maybe you and your worker could make a point of writing down some of the things that were successful last week." Make information more personal and memorable. Repeat information, and ask the client to discuss what they have understood.
	Alan is interested in music and can remember everything about his favorite band. When it comes to what you talk about, he always seems to draw a blank.	"Alan, maybe we could capitalize on your interest in bands. Is there a song that you can think of that will remind you to think before you act?" Most often, selective memory is not intentional, though it can be frustrating for others. Be aware of your own emotional response, and seek support as needed.

PROBLEM	EXAMPLES	WHAT TO DO
Confabulation When memory is poor and the client's attention, concentration, and reasoning abilities are affected, they may fill in the blanks with information that seems sensible. They may even have difficulty distinguishing thoughts about events from the events themselves.	June tells you that she saw her father last week, but you know her father was not in town.	Treat misinformation as a confabulation rather than an intentional lie. "June, can I tell you what I know? You told me your father would be away this week." Avoid open-ended questions, and begin by giving information to clients who are known to confabulate. "June, you told me your father was going to be out of town this weekend. Can you check your datebook so we can review your weekend?"
	Joe often seems to be making up stories about seeing friends you know he hasn't seen in a while.	Do not repeat confabulated information. Just provide the correct information. "Joe, you feel close to your friend. Can I remind you what you told me about your buddy leaving town? You mentioned a visit with your family this weekend." Prevent confabulation by opening discussions with information.
	Donna re-tells very elaborate discussions she's had with her mother when you know she can't remember that much detail about most events.	Include others who can provide correct information. "Donna, you visited your family this weekend. Perhaps Sandy (Rehabilitation Specialist) has more information about the details."

We learn best when there is a reward, and our memories are often more vivid when something has been distressing or frightening.

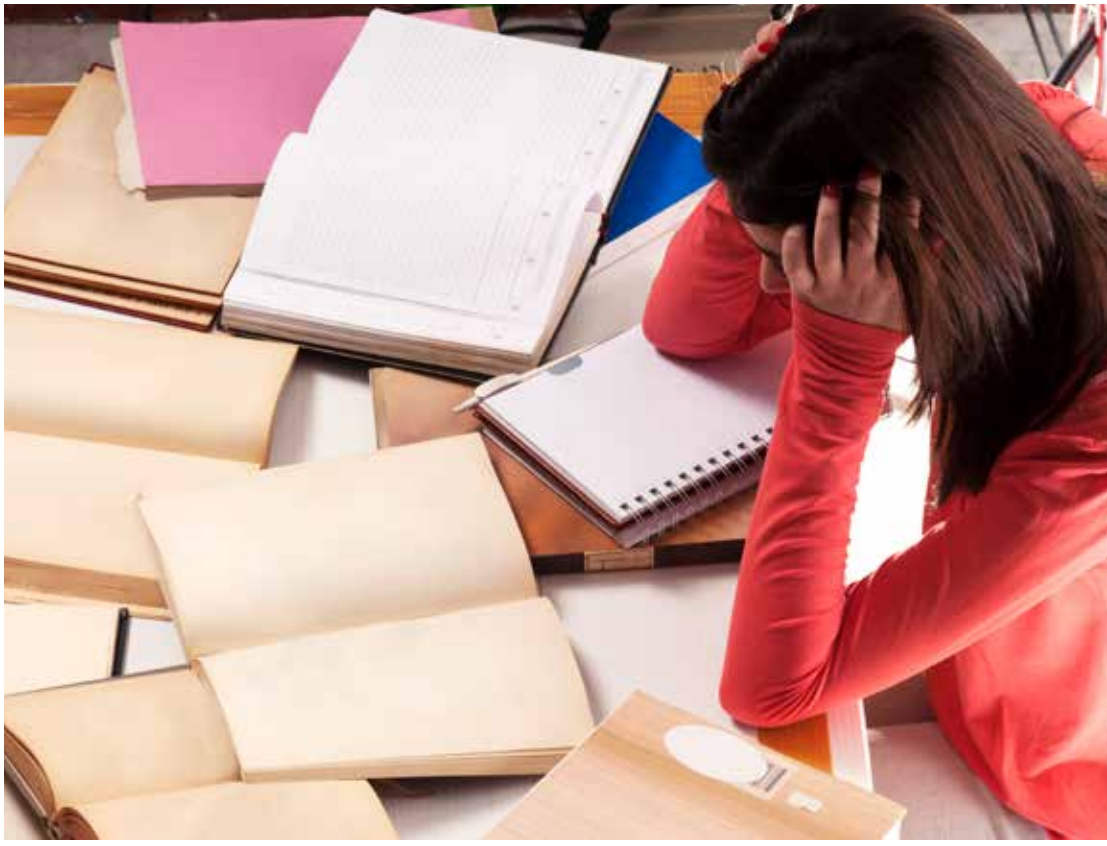
Problems with Executive Functioning

Executive functions are the cognitive processes that are responsible for regulating and managing both thinking and behavior. The term "frontal lobe functioning" is sometimes used interchangeably with "executive functions" because so much of these activities are mediated by structures in the frontal lobes.

Difficulty with executive functioning is common as the result of both brain injury and the toxic effects of many substances. These difficulties may be particularly difficult to understand because they are often present when a person has few, if any, other obvious cognitive or physical disabilities. For example, difficulty with initiation may cause someone to appear to be lazy or unmotivated because they remain passive (watching TV or sleeping), even when they are aware that there is something to be done. In this case, the brain is not providing the signal that a new action is required, and/or the individual has difficulty in setting the right goal or making an appropriate plan. When a person has difficulty seeing the big picture, planning, or problem-solving, they may seem to be making excuses or being uncooperative. Meta-cognitive strategies—teaching a client a way to think about thinking—are particularly useful for people who have difficulty self-regulating their behavior.

When a person has problems with executive functioning, you may notice:

- Difficulty generating new ideas.
- Trouble getting started on activities.
- Trouble finishing activities.
- Neglecting goals or things that seem important.
- Stubbornly sticking to one way of doing or thinking about things.
- Difficulty making decisions.
- Difficulty solving problems.
- Trouble setting goals and organizing activities.
- Being inconsistent in doing tasks.
- Having difficulty applying information or skills learned in one context to other contexts.
- Having trouble seeing the big picture.
- Getting caught in detail and neglecting the big picture.



What you can do to help:

- Help clients to create daily morning, noon, and night routines to check their appointment book and to-do lists. Morning orientation should be the plan for the day.
- Create structured routines.
- Provide external reminders or alerts.
- Teach Meta-cognitive Strategies.
- Discuss how learning in one aspect of the program directly applies to future phases or activities.

Meta-Cognitive strategies. Recall that much of what allows good executive functioning occurs without a lot of conscious thinking. When these automatic processes are disrupted, the goal becomes getting conscious processes to work in their place. A script (outlining a process) is reviewed with the client. The client is taught to recognize where and when a particular strategy might be useful and is then encouraged to use that strategy, with support. When the client demonstrates the ability to remember the script, they are encouraged to use it in a functional way, with gradually fading cues. It's important to remember that clients may need help specifically in identifying the situations where a strategy may be useful if they have problems generalizing learning from one setting to a new setting. One example from a substance use setting is a cue to think about triggers by remembering, "People, Places, Things."

STOP and THINK: A commonly used meta-cognitive strategy in substance use settings is "STOP and THINK." The client may be assisted in identifying situations in which it would be helpful to consider an action before taking it. For example, a client may recognize a strong emotion or an urge to use a substance. They are taught to say or think, "STOP and THINK," along with a script such as, "What is my goal? What will help me achieve my goal?" Another common adaptation is using the acronym STOP—"Stop, Think, Observe, Proceed." They may be directed to a cue card which provides helpful information that may be used in such a case, such as a help-line phone number. This skill may need to be practiced many times in session before a client learns to use it outside of a clinical session. Generalizing outside the session may require helping clients to identify their own high-risk situations and use a memory aid such as a sign or to use the strategy as requested.

ZOOM-IN and ZOOM-OUT: It is common for clients with executive functioning difficulties to have difficulty considering relevant details or seeing the big picture.[43] If a client is giving a vague account of a situation, the provider may cue the client to "ZOOM-IN" to details such as where they were, who was present, etc. A client may be cued to "ZOOM-OUT" as a cue to consider elements of the bigger picture that they might be missing. For example, a client may refuse a particular treatment program because they are not sure how to get there on public transit. You might ask them to ZOOM-OUT to consider whether they might attend if they knew how to get to the program and where they might access transit information.

Goal, Plan, Do, Review, Revise (Goal Management Training): Often, clients will have difficulty in setting specific goals and, in the absence of a realistic plan, fail to make progress. When Goal Management Training (GMT)[44] is applied systematically by a trained provider, it has been found to improve planning and problem-solving in people seeking treatment for substance use disorders as well as people in brain injury settings.[45] It is important to be consistent in the use of the strategy, commit the process to paper, and help clients systematically evaluate their progress and revise their goals. This is another strategy that would be practiced over a period

of time in sessions with a client before it is used more independently. Clients may need help to see the many situations in which developing a goal and planning for any task that is not going as well as they would like can be useful.

One commonly used version of this strategy includes the following steps:

- Set a goal. The goal should be specific and achievable, and have a timeline.
- Brainstorm possible solutions. The goal is to generate as many solutions as possible to be evaluated later. Creative thinking should be encouraged.
- The pros and cons of each potential strategy should be weighed.
- A specific plan to implement the chosen strategy should be created.
- The plan is implemented.
- The results of the plan are reviewed.
- Future plans are revised as required.

Other general strategies include:

- Using checklists and other organizing strategies.
- Using alarms and cues.
- Learning cognitive routines such as “STOP, think, and then act.”
- Providing feedback. Be clear with expectations and consequences (including things that are rewarding).
- Using routines, such as keeping important items like keys and wallet near the door.
- Setting a clear agenda for interactions. Let the person know what the goal is, your role, and what is expected.
- Helping people generalize skills from one setting to another.
- Help clients with difficulties in problem-solving to think through a “Plan B” if things do not go as anticipated.

PROBLEM	EXAMPLES	WHAT TO DO
Difficulty getting started	Andrea seems to need someone with her, or she doesn't get to sessions. Without someone there, she would watch TV all day. When she gets to sessions, though, she works well and is glad that she came.	Teach Andrea that she may be having a problem with (alerting) attention. Create a plan with Andrea that includes a reminder or alarm to get ready to leave, the route to take, items to bring. Offer a small incentive for attending, such as a coffee or entry for a prize lottery.
	Eric can describe his homework assignments but doesn't seem to get any done.	Link the desired behavior to a routine "Eric, you seem to be having difficulty getting around to reading your notes from the session. What do you usually do in the morning? Would it work to leave your notes on the kitchen table to review after breakfast?"
	Heather sets goals for herself but doesn't get started.	Engage environmental supports "Heather, you seem to do best when someone works with you. Is there someone you could ask to work with you?"
Difficulty setting goals	Allen keeps talking about going back to construction work, even though he's been on disability for many years.	Cue Allen to "ZOOM-OUT" to consider the big picture. Ask evoking questions: "When did you last work?" "What have you done recently that is like work?" "What has kept you from work?" "Why do you want to work?"
Difficulty making plans	Allen tells you he's bored and wants to volunteer.	After the big picture has been discussed, consider asking Allen to "ZOOM-IN." "Allen, you said you're bored, and maybe you'll volunteer. Can we 'ZOOM-IN' on that? What have you enjoyed recently? How would you get information about volunteering?"
	Sandra agrees that she'd like to keep away from friends who continue to use marijuana and says she'll try. However, she can't say exactly how she'll do this.	Make a plan using the GMT framework. "Sandra, it's really hard to say 'No' when you don't have other things to do. Would it help to put some activities into your day? Would it help to practice being assertive with your friends?" "Sandra, you're setting a goal to find new friends and activities. Let's take out some paper and work through Goal, Plan, Do, Review, Revise."

PROBLEM	EXAMPLES	WHAT TO DO
Difficulty learning from mistakes When executive functioning is working well, making a mistake builds a memory that comes with a feeling of dread that helps you avoid making the same mistake again. When this function isn't working, clients may not have the feelings of anxiety or dread that encourage them to be cautious.	Jennifer has had trouble with her old friends the past three weekends. Even so, she doesn't seem at all worried about going back to them. She seems unaware of the difficulty she's likely to have and insists things will be fine.	This is a difficult problem to work around. Helping clients to accept structure in the environment is often the best alternative. Strategies from Motivational Interviewing often help. "Jennifer, going back to the neighborhood keeps creating trouble for you. Is there any plan we can make for the weekend that will give you someplace else to go? Who could help?" *(Use GMT Framework to plan.)*
	Dan seems to know that he's headed for trouble but doesn't take any steps to change course.	Use ZOOM-IN, ZOOM-OUT to help Dan see the bigger picture. "Dan, maybe the best way to avoid a problem is to get someone to work with you as a coach. Let's talk through this situation and see if we can predict where it might be headed. If you're not happy with the outcome, maybe we can think of an alternate plan." *(Use GMT Framework.)*
Difficulty thinking before acting Thinking ahead requires us to keep future consequences in mind and forgo current good feelings. This is an issue for anyone who is trying to change a substance use habit. However, for clients living with brain injury, the problem is multiplied. After a brain injury, a client may become impulsive. Sometimes, the problem is losing track of a future goal. Sometimes it's a limited memory of the harms that arise from using. Sometimes, it's simply difficulty resisting the pull of habits or strong cues and triggers.	Jerry expresses a desire to remain sober, but if he has more than a few dollars in his pocket and sees the opportunity to buy, he will. He's always remorseful later.	Minimize exposure to high-risk situations until a productive response is developed and rehearsed. Consider environmental supports such as avoiding carrying cash or cards. "Jerry, we've been practicing STOP in sessions. Let's make a plan to use Stop, Think, Observe and Proceed. When does the problem happen? Should we make a plan that you can use? Maybe it would be a good idea to avoid carrying your cash card with you." *(Use GMT Framework.)*
	Andy has a temper. When he gets upset with his roommate, he bolts out the door. In that mood, he's likely to go to the bar.	Practice STOP in sessions. "Andy, we've been using STOP to think things through before acting. Let's talk about how you'll know it's time to use that strategy."
	When Dean sees a drink, he seems to stop thinking about anything else.	"Dean, when you're with people who are drinking, it gets pretty tough. What would be the best way to avoid getting into that situation? Where would you be less triggered? Let's make a plan to stick to safer places." This may require direct cues from a caregiver or the use of signs or other visible cues.

PROBLEM	EXAMPLES	WHAT TO DO
Empathy Recognizing and responding to others' emotions is a complex process. Without a normal ability to feel an emotion, it can be hard to relate to others. This problem often does not resolve. Some clients just forget to think about things from the other person's point of view; some clients can't shift mental sets, and they get stuck on their own way of seeing things. People who have difficulty empathizing with others will find social interaction confusing and frustrating. Often, establishing simple rules of interaction will help. Encourage clients to identify a trusted person who can act as a coach in difficult social situations.	Geoff is often late for sessions but is angry when he is asked to leave after his appointment time has ended.	Help the client recognize the other person's point of view in a nonjudgmental way. This may require you to be blunter than you would typically be with other clients. However, delivered in a factual way, these statements can inform clients and help them respond more appropriately to the situation. "Geoff, I'm sorry that we don't have as much time as usual. I know that you don't like to wait for me. That's why I don't want to make my next client wait."
	Ellen can't understand why her sister doesn't come over more often, even though she is a single, working mother.	"Ellen, let's think about this from your sister's point of view. What else might she be doing? She has children, doesn't she?"
	Paul expects that you will put other tasks aside to answer his frequent questions.	"Paul, I have many things I need to do in a day. I need to ask you to wait so that I can meet all of my responsibilities. I can answer questions for five minutes."
	After Sarah talks about a troubling event from her childhood, Alan remarks: "So what? It was a long time ago."	In group, provide nonjudgmental feedback: "Alan, I know it's hard for you to relate to how Sarah is feeling, but it's helpful to show respect for her feelings now by listening to her and trying to understand." Outside of the group, provide instruction in an appropriate response: "Alan, I guess it's hard to understand why some people feel the way they do. The important thing is to show them respect by listening and try to see things from their point of view without arguing. It usually doesn't help to tell someone they are wrong about how they feel." "We can practice empathy together by identifying the feelings that came up in the group." Consider limiting participation in the group to sessions that are more educational in nature.

Problems with Communication

Often, people living with the effects of TBI demonstrate some difficulty with communication, including difficulty with expressing ideas or difficulty in understanding others' communications. The ability to speak, read, and understand oral communication may be affected. When speech is very difficult or impossible to understand, the person should be encouraged to use notes or a communication aid such as computer-assisted writing or speech.

Some of the most common difficulties with communication are the nonverbal or social aspects of communication. This includes the ability to read others' facial expressions and nonverbal communications, following social rules of interaction such as turn-taking, maintaining a topic, considering the point of view of the person you're speaking with, and organizing a message in a way that considers the situation at hand.

In general, it's best to avoid assuming that an individual is aware that their behavior is not appropriate to a situation. The feedback you provide should be non-judgmental and specific, with information about how to correct what is happening.

Avoid general feedback, such as "That's not appropriate," in favor of specific feedback, provided privately, if possible. For example, "It's important for everyone to have a turn to speak. I'll give you a sign if you're interrupting." Smaller, more-structured groups are helpful. To help prevent problems, provide general reminders about expectations to support clients. Remind group members at the start of meetings about group rules or norms.

When a person is having problems with communication, you may observe:

- Speech that is difficult to understand or the use of a communication aid.
- Struggling for the right word to say or using words in an unusual way.
- Using vague terms, e.g., "the thingy," or vague phrases, e.g., "and stuff" frequently.
- Frequent misunderstandings, breaking rules, or responses that are not on topic.

- Long pauses in conversations—taking a long time to respond to a question.
- Speaking in a monotone voice or with an expressionless face.
- Interruptions, dominating a conversation, not knowing when to contribute.
- Behavior that seems insensitive or childish.
- Difficulty understanding jokes or sarcasm.

What you can do to help:

- Set a goal of working with clients to determine how they communicate best.
- Use re-statements and reflections to ensure that a client has been understood.
- Encourage clients to re-state their understanding.
- Don't guess if a client is difficult to understand. Ask for repetition.
- Plan for smaller groups.
- Help clients to prepare for groups or important conversations using worksheets, notes, or rehearsal.
- Provide verbal information when a client has missed social cues.
- Teach clients to ask how others are feeling and for feedback.
- Provide information and feedback in a neutral way.

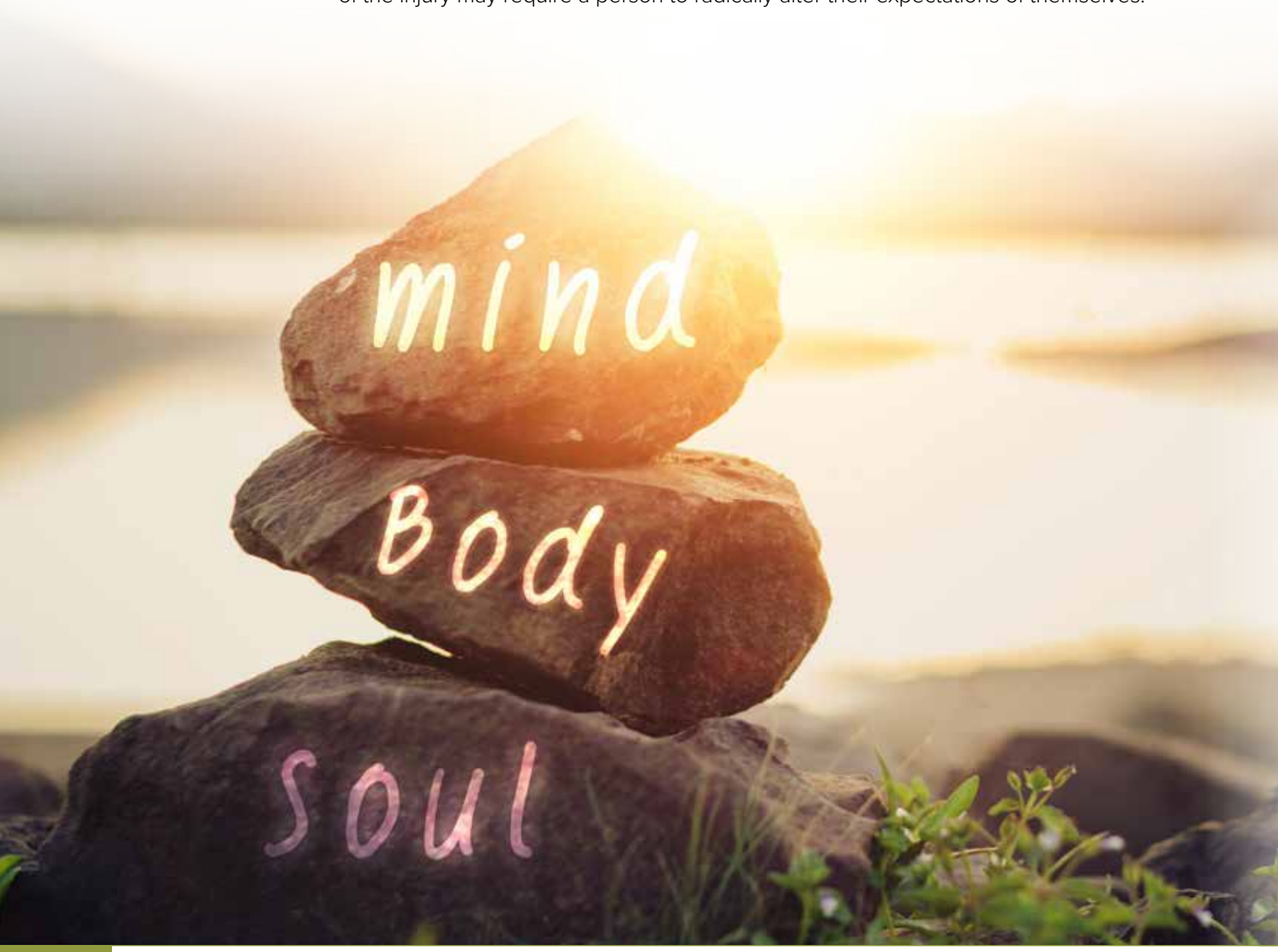
PROBLEM	EXAMPLES	WHAT TO DO
Speaking Speaking is a very complicated process that involves both the muscles that support breathing and muscles that move the mouth. Even though clients may have trouble speaking, they may have no problems understanding.	Al sometimes talks very quickly, and you can't understand what he is saying.	Clients with speech difficulties are usually aware that they are sometimes misunderstood and generally appreciate it when you take the time to ask for and listen to a repetition. Have a frank discussion about communication, and ask about the use of communication aids. Let your clients know that you will ask for repetition if you don't understand. Ask your clients what they would like you to do to ensure that they are being understood. You will also get used to the way clients speak, and your ability to understand them will improve as you work with them. "Al, I notice that you sometimes speak quickly, and I can't keep up. What is the best way to let you know that I need you to slow down?"
	John has so much trouble speaking that you understand only half of what he has said.	"John, it's important that I understand what you are saying. I hope you don't mind if I check my understanding by repeating what you've said."
When a client cannot speak and uses a device such as a language board, it is important to learn how they use it.	Debra doesn't speak at all. She uses a computer to assist her communication. It takes a while for her to type out her remarks. Sometimes others in the group talk for her or start talking while she is typing.	Debra may require longer sessions to allow for a slower pace of conversation. Encourage Debra to introduce her communication aid to the group. Encourage her to prepare important information ahead of time (such as an accomplishment or event) so that she can share it with the group by having them read to the group.

PROBLEM	EXAMPLES	WHAT TO DO
Understanding and expressing The term "aphasia" refers to difficulty using some aspect of language. Sometimes aphasia is receptive, meaning that there is some difficulty understanding what has been said. Sometimes aphasia is expressive, meaning that there is difficulty expressing an idea or finding a word. Aphasia can also be associated with difficulty reading and writing. Just about any combination of problems using language is possible.	Carrie always seems to have words on the tip of her tongue. She knows what she wants to say but can't get it out.	When clients are diagnosed with aphasia, it is important to consult with a rehabilitation professional regarding the best communication techniques to use. If this is not available, take time to see what they are able to read and write. Sometimes the problem is simply finding the right word. If this is the case, a little patience is all that is necessary. It can be helpful to encourage a client to talk around a wanted word. Sometimes clients will appreciate it if you help them to fill in the missing word. Be sure to be sensitive to their preferences. "Carrie, you seem to be stuck looking for the word. Can you tell me more about it? What did it look like? When did you see it?"
	Al seems to draw a blank at times. He uses phrases like "that thing," or "you know," and sometimes you don't understand what he's saying.	"Al, you said, 'that thing,' and I'm not sure I understand. Should I guess? Are you talking about the cell phone?"
Social aspects of communication Clients with brain injuries may have difficulty reading social cues in a way that interferes with their ability to hold a productive conversation. They may forget to take turns appropriately, switch topics without any warning, or fail to respond to what you said. Other clients may stand too close or project facial expressions or body language that does not match what they are saying.	Zoey starts a story and just keeps talking. She doesn't seem to notice that someone else would like to say something. Lianne doesn't seem to keep track of her listener's point of view. Sometimes she changes topics suddenly. Sometimes she refers to people and places her listener knows nothing about. John always seems to stand too close to the people he's speaking with. Ellen always looks angry. She doesn't smile much, even when she's talking about something that you think would make her happy.	Preparation and rehearsal can help a client have more confidence in a group setting. It can be helpful to lay out some ground rules for communication. Set up obvious signals to cue the client when it's time to listen and when it's time to talk. A "talking stick" is one example. Make a habit of providing verbal summaries and asking the client to do the same. Always let a client know when you need clarification. "Zoey, I want to be sure I can get some information across to you. Can we agree that, when I need to say something, I'll raise my hand to let you know?" "May I interrupt you to tell you something? If I understood you correctly, you said…." "Just so I know that we understand each other, can you summarize what I have said?" "Lianne, I think that you've changed topics. Are you talking about your weekend now?" "Lianne, I don't know George. Who is he?" "John, I'd like a little more space. I get a little uncomfortable with you so close." "Ellen, I don't know if you realize that you look angry, but, from what you're saying, you seem pleased. How are you feeling about that?"

Difficulties with Self-Awareness

Self-awareness is probably the most complex of human abilities. It gives us an accurate picture of our strengths and weaknesses. Good self-awareness depends upon many cognitive functions working together, as well as psychological factors, such as a person's willingness to accept and acknowledge their strengths and weaknesses. Unlike other cognitive difficulties that may be directly observed, self-awareness can be more difficult to assess. However, understanding how aware an individual is of their impairments can be very important in determining the course of intervention.

Developing self-awareness related to newly acquired problems is often difficult after a brain injury. To develop self-awareness, an individual needs to notice the relationship between a behavior and its consequences. That may seem straightforward, but when clients have problems with attention, memory, reading, understanding their own emotions, and with problem-solving and reasoning, it's not surprising that they have difficulty recognizing when something that they are doing is contributing to the problems they are experiencing. It is also important to consider that most injuries occur suddenly, as the result of trauma or illness, and that the results of the injury may require a person to radically alter their expectations of themselves.



It takes a great deal of emotional strength to let go of old expectations (things that used to be easy) and make a new plan for life that takes into consideration the changes brought on by the brain injury. When a client seems to be repeating mistakes, or their behavior is inappropriate to the situation, it's usually best to assume that the client is unaware that what they are doing is a problem.

Although we can understand awareness as developing in stages, factors like fatigue, distraction, and anxiety can cause a client's apparent level of awareness to fluctuate. Sometimes, especially right after a mistake has been made, clients seem to have increased self-awareness. However, they may appear to forget the lesson learned at a later time. Clients may also be aware of one type of problem and have a blind spot when it comes to something else. Finally, awareness of difficulties seems to diminish when a client is confronted or feels defensive.

What follows is an adaptation of a model presented by Barco, Crosson, Bolesta, Werts, and Stout (1991).[46] It is important to realize that the degree of awareness that clients show in one area of functioning (e.g., physical impairment) may be different than the degree of awareness that they demonstrate in another (e.g., social interaction).

LEVELS OF SELF-AWARENESS		COMMON CLIENT COMMENTS
Little or no self-awareness	Brianna is not able to recognize their difficulties.	"I don't have a brain injury." "Everyone has some problems with memory." "I never did that very well."
Intellectual	Jamal comments focus on others or the environment. Jamal can name difficulties but cannot identify how they interfere with day-to-day functioning.	"My mom says I'm forgetful." "The doctor tells me I have bad judgment."
Emergent	Cheyenne acknowledges problems but limits their importance or attaches the problem to a person or circumstance. They may know what to do to prevent a problem but can't make a commitment to using the strategy regularly.	"There are times when I forget things, but it's no big deal." "I don't remember things that are not important to me."
Anticipatory	Antonio states the problem and can see the need to plan ahead even if he has not yet figured out what to do.	"I have a lot of trouble with names, so I take notes." "I have the hardest time when I'm tired." "I need some help to learn new information at work."

Learning about Your Client's Level of Self-Awareness

Clients may use different language than you do to describe their problems. It's common for clients to say that they don't really have a memory problem because they know that they can remember events from before their injury. However, if you ask them whether they remember appointments or other information that they recently acquired, they readily acknowledge that they have a problem.

Start your interview with general questions, and follow up with more specific ones. When clients can respond to a general question with details about their impairments and what they do to compensate, they probably have more self-awareness than clients who require specific questioning to elicit information about their day-to-day functioning. Often a client will appear to be functioning well when you first meet them or deny having any difficulties. They may describe compensation strategies that they have been taught but don't use consistently. Difficulties with cognition and compensation may become apparent only if a client demonstrates difficulty with follow-through.

Applying cognitive compensation supports the process of treatment. Below is a summary of how clinicians might use the information in this chapter to support cognitive function, promote attendance in treatment, minimize errors, reinforce learning, and support attention.

General Principles for Cognitive Compensation

Simple and direct are best: Rather than suggesting a general memory strategy, such as "Write things down," talk with a client about the problem to be addressed, (e.g., remembering an appointment), and work out where the information should go (e.g., in your phone with an alarm, or on the fridge-door calendar).

Use Routines: The use of routines helps keep situations predictable and takes advantage of our natural-habit autopilot to keep a new behavior going. Making something routine may mean attaching it to an existing habit (before bed, at meals, when the nightly news comes on).

Be collaborative: Work with your client to recognize cognitive barriers and choose the compensation strategies they feel will work best for them. Some trial and error may be needed to get the desired results.

No two people are alike: What works for some clients or in some situations may not work for all. Be flexible and persistent.

Support Attendance and Participation

- Plan sessions for a time of day when the client is most alert.
- Keep sessions at a routine time, day of the week, place, and location.
- Adjust the amount of time spent with the client—shorter when fatigue and attention are an issue, slightly longer when transitions are a problem and/or communication is slowed.
- Use appointment cards as reminders, and include the purpose of the visit.
- Support the client to use the reminder/calendar function of their smartphones.
- Consider reminder phone calls or text messages.
- Actively plan with clients about how they will remember to attend the appointment, working out reminders, timing and payment for transportation, and other matters such as getting meals and childcare.
- Consider providing support to accompany clients to critical appointments.
- Help a client to plan for the completion of homework or for completing requests in session.

Support Attention and Comprehension

- Slow down your speech and use simple sentences.
- Identify and remove distractions for the client before starting a session.
- Re-state, or, where feasible, keep a written chart of topics discussed.
- Use the client's name frequently to encourage them to focus their attention on the discussion.
- Schedule breaks regularly, and suggest a break if the client's attention seems to be waning.

Support Learning and Memory

- Avoid asking clients to guess at information. Provide information if a client seems to be struggling.
- Summarize and repeat information frequently.
- Use supportive cues when asking the client to summarize information (e.g., have the client fill in one fact at a time until all of the information has been learned).
- Start the session by recapping information covered in the previous session.
- Use written goals and agendas that are visible to the client during the session.
- Incorporate a review and summary to conclude sessions.
- Use a jointly written note, brief video or audio summary, or a picture of session notes as a reminder.
- Check a client's understanding of information throughout the session.
- Take care when using metaphors. Make sure that they are understood in the manner intended.
- Use examples from a client's life.

Support Follow-Through with Goals and Tasks

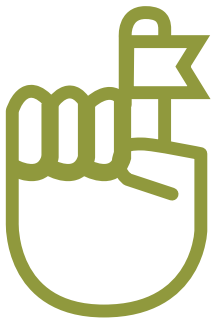
- Be sure that expectations are understood.
- Be sure that expectations are in line with clients' goals.
- Be sure that expectations are in line with clients' abilities.
- Make a specific plan to use a reminder (what, when, and how).
- Use environmental supports.
- Make clear links between how information or skills can be applied in day-to-day situations.

Promote Self-Awareness

- Provide clear and specific, nonjudgmental feedback. Don't assume a client is aware that there is something inappropriate about their behavior.
- Help clients predict their behavior, and track the outcome of situations to support an understanding of cause-and-effect relationships.
- Affirm a client's strengths—self-appreciation increases the willingness to observe challenges.
- Normalize clients' use of environmental support.

Clients are likely to need some support to...

Understand the impact of brain injury and substance use



Remember what to do and when

Make decisions and set clear goals

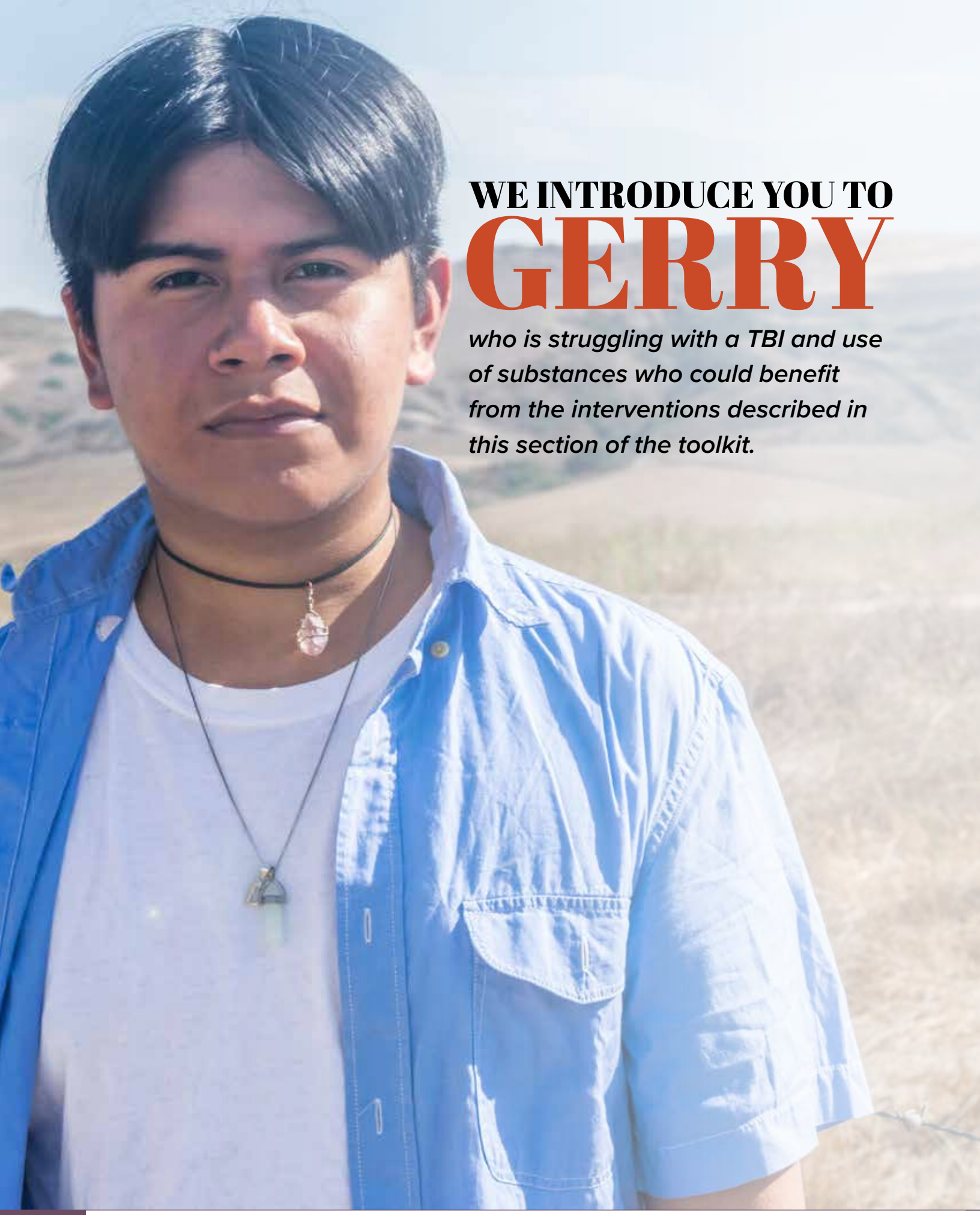
Make plans and problem-solve

Get started starting

Keep track of goals and evaluate progress

SECTION 4

RECOMMENDATIONS FOR SERVICE DELIVERY



WE INTRODUCE YOU TO GERRY

who is struggling with a TBI and use of substances who could benefit from the interventions described in this section of the toolkit.

Gerry is a 25-year-old who was referred for substance use. He's experimented with several drugs and uses about 2 grams of cannabis daily, but the substance of concern listed on his application for service is alcohol. After three attempts, he is present for his intake appointment. He was 25 minutes late. He didn't have his identification with him, and he seemed frustrated at the start of the interview. Gerry explained that he wasn't sure he needed treatment for his alcohol use—his girlfriend had asked him to attend the appointment. Once he settled in, Gerry seemed willing to talk about his substance use and could recognize some of the problems it caused. He was able to recognize that there had been times when his behavior got out of hand when he is drinking. He'd broken things in his apartment and had some bad falls. He gets along well with his family most of the time but had had a lot of arguments about his drinking. He's been able to go for weeks without drinking too much after an argument, but he states he keeps screwing up.

Although he had some trouble with timelines, Gerry was able to tell you about his history. He had a great family life and was one of five kids. He had an uncle and grandfather who had a problem with alcohol, and when he was growing up, they didn't keep alcohol at home. He finished high school. He has been working as a laborer on construction sites. He is hoping to get his license as a plumber. From the time he was of legal drinking age, he drank regularly with his friends. He didn't finish all of the intake paperwork, but he denied having any health problems when asked.

Gerry agreed to a second appointment but didn't show up. When he called to make another appointment, his girlfriend could be heard in the background. After six weeks of very limited progress, Gerry's provider began to question Gerry's motivation. He was often late or missed appointments. He never seemed to make it to groups or sessions unless someone dropped him off. He seemed sincere when he was talking about the changes he wanted to make but didn't follow through with any of the plans he made in sessions. He went to a few group sessions and sometimes made relevant comments. After about a half-hour or so, he'd start to fidget to the point that other group members were distracted. There were even times that he looked like he might be ready to fall asleep. He apologized but then did the same thing again.

Gerry's provider started to ask more questions about his history and learned that Gerry had been in a car accident at the age of fifteen. He was knocked out for twenty minutes or so. He had fractured his spine, and his rehabilitation team focused on that. His rehabilitation took a couple of years, and he missed a lot of school. School was a bit harder for him when he finally got back to it. He noticed that his memory wasn't as good and that there were some things about his personality that had changed, too. He had been a careful, kind of shy person before his injury but seemed to be more outgoing after the injury. Before his accident, he kept his room neat and his collections of sports memorabilia organized. After his injury, he was still interested in sports but had trouble keeping his stuff organized. He lost some of his friends because they thought his behavior was sort of childish. He was described as a bit of a hothead.

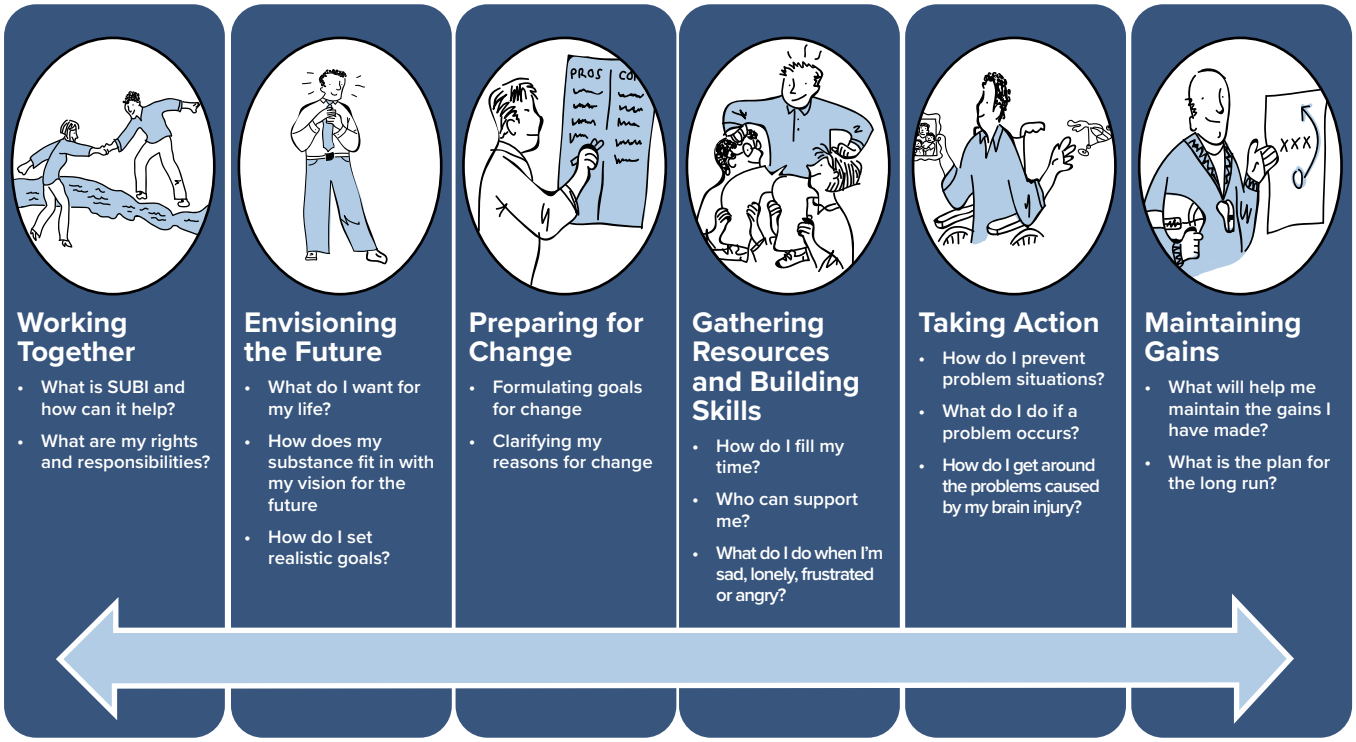
Recommendations for Service Delivery

Programs geared to support individuals with concurrent disorders, including the impact of brain injury, will generally need to take a long-term perspective, anticipating that the course of intervention will take longer than for individuals with less complex difficulties. Many people living with brain injury will require more individualized support and case management to achieve their goals. The goals of case management will be largely determined by the client's stage of change with respect to their substance use, as well as their level of awareness of the difficulties that they are having as the result of their cognitive impairments. People who are less aware of the difficulties they are having with cognition and/or are not compensating for the difficulties they have in a meaningful way are much more likely to require environmental support to achieve their goals.

Like established models of care for people living with mental health and substance use disorders, intervention is best conceptualized as occurring in phases, each with its own set of key tasks.[47] The first phase, sometimes called engagement, is focused on doing whatever is necessary to support a client to become engaged in intervention and building expectations for intervention as well as for a strong working alliance. Once engaged, the goals of intervention may begin to focus on changes in behavior that reduce harm, support a healthy and engaged lifestyle, and may result in reducing substance use. Tasks associated with this phase in intervention may focus on helping a client to better understand how substance use is interfering with achieving a more desirable lifestyle. Once the motivation for change has been well established, a phase of preparation may follow. Tasks associated with this phase often include activities that directly compete with substance use but may also include preparing for referral to a structured treatment program for further intervention. Once a plan has been established, a phase of action will follow. When some success has been achieved, goals will turn to maintaining the gains realized through intervention.

The figures that follow provide an overview of the phases of care as adapted by the Substance Use and Brain Injury Bridging Project at Community Head Injury Resource Services of Toronto.

Client Introduction to Model of Intervention



Working Together

- What is SUBI and how can it help?
- What are my rights and responsibilities?

Envisioning the Future

- What do I want for my life?
- How does my substance fit in with my vision for the future
- How do I set realistic goals?

Preparing for Change

- Formulating goals for change
- Clarifying my reasons for change

Gathering Resources and Building Skills

- How do I fill my time?
- Who can support me?
- What do I do when I'm sad, lonely, frustrated or angry?

Taking Action

- How do I prevent problem situations?
- What do I do if a problem occurs?
- How do I get around the problems caused by my brain injury?

Maintaining Gains

- What will help me maintain the gains I have made?
- What is the plan for the long run?

Provider Guide for Intervention

Building Alliance

- Setting Norms/Routines
- Creating an Emotionally Safe Environment

Enhancing Motivation for Change

- Clarification of Personal Goals
- Building Discrepancy
- Fishing for Change Talk

Preparation

- Building a Schedule of Competing Activity
- Building a Social Network/Supports
- Setting Achievable Goals

Action

- Skill Building
- Specific Changes Strategies for Substance Use

Relapse Prevention

- Managing Lapses
- Building a Follow-up Plan

Substance Use and Brain Injury (SUBI) Workbook

Understanding and implementing cognitive adaptations can be daunting for service providers new to working with individuals with cognitive impairment. The SUBI Workbook (link below) was designed to illustrate how to implement many of the recommendations reviewed in this toolkit.

Its primary purpose is to illustrate how to provide organizational cues, elicit information from the client using self-assessments, and simply present the material. Goal statements help clients to understand the context for the information provided. The written format acts as a memory aid. The workbook is not intended to be a complete program of care. Rather, it's a set of resources that can be modified or used as a jumping-off point to develop new materials. It is available free of charge through the SUBI website, www.SUBI.ca.

Key Considerations in Program Development:

Longer-term interventions and smaller caseloads may be required to adequately address clients' needs. Clients with brain injury present with greater symptom complexity and are likely to require longer periods of intervention along with more integrated aftercare supports.

Coordination with community partners will be needed. This will likely require actively reaching out to, and creating partnerships with, brain injury providers and other support agencies in the community.

Providers should recognize the elevated risks for impulsive behavior, including suicide, and regularly assess suicide risk.

Providers should be aware of these elevated risks of pain, seizure, endocrine, and neurogenerative disorders and make referrals for assessment as required.

Addressing the Gap between "Say" and "Do" with Environmental Supports

As a general rule, the more limited or inconsistent an individual's level of awareness, the more likely they are to require environmental supports to accomplish their goals. Often, the difficulty the client is having in following through with therapy-related tasks is that they are distracted by their current environment and begin to neglect the goal that they had sincerely expressed in a therapy session. Failing to meet a goal may cause a client to avoid treatment settings. Difficulty with follow-through will often result in clients being labeled "unmotivated" or "uncooperative." The provision of environmental supports helps clients to stay in treatment and achieve treatment goals.

AWARENESS	STAGE OF CHANGE[48]	COMMON TASKS IN AN INTERVENTION
Little or no self-awareness	Pre-Contemplative. May not have identified the negative consequences of substance use. Not yet expressing a desire for change. May avoid discussion about substance use.	Emphasis is on environmental supports, working directly with a client to achieve goals. Establish rapport, and reduce barriers to attending intervention. Support participation in non-use-related activities. With permission, provide factual information about the impact of substance use. Support the client in developing and talking about their current goals and priorities. Support client to determine how substance use may interfere with stated goals/priorities. Harm-reduction strategies.
Intellectual	Contemplative. Expressing ambivalence about changing substance use.	Environmental supports remain primary. Support the development of awareness by predicting and tracking outcomes and supportive/non-judgmental feedback. Support client to weigh the risks and benefits of substance use.
Emergent	Preparation. Maybe taking small steps (e.g., seeking information)	Continued environmental supports with collaborative problem-solving and planning.
Anticipatory	Action.	Increased emphasis on self-management. Client may be taking on more responsibility for maintaining environmental supports or taking independent action.

Broadly defined, environmental supports include any type of external assistance provided to the client in the completion of a goal. Environmental support may range from walking a client through a process step by step to simply a cue to get started on something that they have agreed is important. In any case, it is the role of the clinician to work collaboratively with a client to determine what sort of support might be most useful and to assist the client in arranging that support and monitoring the outcome. It may be that, once a routine has been built to accomplish a task, such as taking medication, attending groups, or participating in some activity, environmental support can be reduced to allow for more independent functioning.

One concern that arises with therapists is that taking responsibility for the follow-through on a goal may instill helplessness or dependence in a client. However, supporting a client in meeting a goal is much more likely to lead to the kind of positive momentum that fuels future goal attainment. Plans for environmental support may include encouraging the client to take more control of the situation as they become more successful. Some clients may feel that they should be relying on "willpower" or their own abilities and feel ashamed to accept support. In that case, the role of the therapist is to normalize the need for support and to assist the client in formulating the right support. The therapist may also propose options for the client. Most often, environmental supports are best accepted and most effective if they are the result of collaborative goal setting and planning with the client.

Strategies to develop environmental supports:

1. Confirm that the client is interested in achieving the goal.
2. Identify barriers to goal completion.
3. Identify potential supports in the form of cues, planning, or direct or behavioral support to initiate.
4. Negotiate the right level of support with the client. Support clients in identifying the barriers, and consider what they might find helpful.

Below are some examples of using environmental supports to address the cognitive difficulties you observe.

WHAT YOU OBSERVE	POTENTIAL BARRIERS	CUE	PLANNING	DIRECT	BEHAVIORAL
Missing Appointments.	Memory: Forget appointment time. Initiation: Miss cues that it is time to go. Neglects goal.	Alarm in phone. Wall calendar.	Use Goal Management Training. Does the client have transportation, have a fare, and know the route?	Escort to appoint-ment. Phone-call reminder.	Incentive for attendance and task completion. Eliminate potential distractions occurring before or during the appointment.
	Gets distracted by trigger.	Gets distracted by trigger. Goal sheet to remind the client of goals.	Take a different route to avoid triggers.		Plan for activity that will compete with trigger situation (e.g., attend a meeting or time with a supportive friend).
Not Completing Assignments.	Forgets or gets distracted.	Cue between sessions.	Make a plan for a particular time and date to complete the assignment.	Complete assignment in session, or coach between sessions.	Offer an incentive for task completion. Pair tasks with something that occurs routinely. Start with very simple tasks, and gradually phase in more complex tasks.
Triggered to Use.	Having available money.	Reminder in wallet about budget.	Plan to leave cash and cards at home except for shopping for necessities.	Guardian or trustee for finances.	Offer incentive for completion of task.
Missing Medication Doses.	Forgetting dose or not taking medications at the correct time.	Daily dose packag-ing. Alarms in phone.	Packing list for day's activity. Simplifying dose regimens when there are multiple medications. Planning doses around routine activities (after evening news, before breakfast).	Directly dispensed and observed doses.	

Adaptations for Group Therapy

If you are offering group therapy, many of the strategies outlined earlier in this toolkit can be incorporated into your program. However, there are some additional strategies you may want to consider:

Create a safe space

- Use name tags.
- Limit groups to five or six participants. Too many individuals in the room may serve as a distraction to those with cognitive impairments.

Promote engagement

- Make individualized attendance plans that include items such as transportation routes and departure times.
- Allow for the possibility of clients leaving sessions early and staff having individual follow-up sessions.

Use a consistent format

- Give time to settle in/brief mindfulness activity.
- Remind group members of important rules/guidelines.
- Provide a brief summary of the previous group.
- Outline the goal for the current session.
- Make the sessions interactive, and build in time for breaks.
- Provide a brief summary at the end.

Promoting Accessible Programming

To support clients living with an Acquired Brain Injury (ABI) in finding and accessing services to meet their needs, partnerships across service sectors can help address complex needs, make cross-referrals more efficient, and reduce barriers to services.

Other key recommendations for service delivery include the following:

1. Evaluate existing resources for clients living with brain injury to identify gaps in services.
2. Consider developing partnerships with state and local brain injury providers.
3. Learn about the programs and entitlements designed for people living with a disability.
    a. Adult survivors of childhood injuries may qualify for benefits for people with a developmental disability, where available.
    b. Programs that screen for and document disability may support access to services and entitlements.
4. Adapt intake and intervention approaches to allow adequate time for developing rapport and engagement. Clients with cognitive impairment will usually require additional time for appointments and longer treatment duration.
5. Individuals providing outreach services to clients living with ABI may need smaller caseloads to support more intensive care (e.g., accompanying clients to appointments).

In addition to the key recommendations above, there are some specific recommendations for different aspects of service delivery, including outreach services, intake, and the physical space in which services will be offered.

Adaptation for Outreach Services

Many people living with cognitive impairment have difficulty identifying and seeking out services that would be beneficial. Resources across service sectors will help clients to find and benefit from your services. In addition, having links with providers in other sectors can serve as a source of consultation and referral. Joint training opportunities with providers of ABI services is one way to make connections and ensure that you are aware of services in your area. For example, offering to swap training or provide training on topics such as the identification of substance use disorders and available treatment opportunities with a provider of ABI services, who can provide similar information related to brain injury, will provide an excellent resource for staff members and begin the process of building referral relationships.

Many clients with brain injury will require a more assertive approach to care, which may include meeting clients in the community. They are also more likely to require case management services that include supporting a client to follow through with a referral.

Adaptation for Intake Services

In the section on assessment, you learned about ways to screen for brain injury as well as the resulting impairments. Often clients with cognitive impairments will have greater difficulty attending appointments on time, waiting for appointments, or following through with multi-stepped referral processes. To avoid barriers to care,

a simplified intake process that includes support to attend the initial appointment minimizes the requirement for documentation and forms to be completed before the appointment and enables you to gather needed information. Optimally, clients will be offered a choice in how to complete paperwork. Options should include the direct assistance of a staff member.

Community Linkages

Given the prevalence of cognitive impairment due to TBI and other brain injuries, substance use disorder treatment programs should consider developing long-standing linkages with brain injury providers. These may take the form of formal or informal consultation, cross-training cooperatives, and the development of care paths. Initial steps may include locating the local chapter of the Brain Injury Alliance or Brain Injury Society. Information about these organizations is provided in the resource section of this toolkit.

Considerations for Physical Space

Universal design principles should be used in the design of clinical programs, including appropriate accommodation for mobility limitations. Signage should clearly indicate program locations. Signage is also helpful for wayfinding, storage of items, and rules of program engagement. Physical cues to increase orientation, such as clocks and calendars, as well as daily program schedules, are also helpful to individuals who may have difficulty in tracking this information. Many clients with brain injury have difficulty managing noisy and/or busy spaces and may need a place to rest to manage fatigue. Having quiet areas for rest or waiting can be very helpful for clients who are easily overstimulated. Maximizing the connection between the indoors and outdoors with natural light is also a feature that supports orientation. Finally, common areas and waiting areas should be large enough and free of clutter to provide sufficient space for people using gait aids or wheelchairs.

Education about Substance Use and Brain injury

For clients who are aware of the cognitive impact of their brain injury, it may be motivating to consider the brain health benefits associated with abstaining from or reducing substance use. Resources for providing this education are included in the resource section of this toolkit.

Substance use after ABI can have the following effects:

- Delayed recovery from brain injury
- Worsening issues with balance, walking, communicating, and thinking (concentration and memory)
- Increased impulsivity
- Self-medicating as a coping strategy
- Increased risk of seizure
- Limited access to housing and healthcare
- Increased risk of another ABI

Motivational Interviewing

Because of its strong evidence base, Motivational Interviewing (MI) plays a prominent role in intervention in most settings supporting people who are living with substance use disorders.[49] MI is a collaborative, goal-oriented style of communication with particular attention to the language of change.[50] It is designed to strengthen personal motivation for, and commitment to, a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion." Supporting your client's success is related to the therapist's abilities to use the 'spirit of MI' to assist with achieving goals. The components of MI spirit include compassion (prioritizing the client's well-being), acceptance (nonjudgmental respect and empathy), and partnership and evocation (supporting a client to recognize and use their strengths in developing and implementing plans for a change).

As discussed in the Brain Basics Section, the brain structures responsible for processing rewards, evaluating risk, memory, and reasoning are all vulnerable to brain injury. We also know that the client's assessment of therapeutic alliance and the therapist's empathy are important in promoting the best possible outcome.[51] As discussed throughout this toolkit, people living with brain injury may face a number of barriers to developing therapeutic rapport, including difficulties with communication, reading and responding accurately to social cues, and the ability to recall interactions. It is also true that many people living with brain injury will have difficulty following through with their intentions. It has been observed that MI may result in positive changes in motivational structure (the desire for change) in people living with brain injury but may not be associated with the desired behavior change in the absence of increased structural and environmental supports.[52, 53] However, when combined with case management supports and incentive programs, Motivational Interviewing may be an important component of an intervention.

Based primarily on clinical experience, the following are considerations in adapting MI for people living with brain injury.

Promote engagement by encouraging positive affect in session. Clients with cognitive impairments are likely to have less specific recall of the content of the session. They will, however, develop an emotional memory that will be associated with the treatment situation. One way that positive affect can be elicited is by focusing on affirming a client's strengths is particularly important for individuals living with memory impairment. It may also be beneficial to elicit discussion about successful interaction or providing a positive experience, such as access to a drop-in, meals, or activities at the end of the session. Ending the session on a positive note may increase engagement. One way that positive affect can be elicited is by focusing on affirming a client's strengths. This is particularly important for clients with memory impairment.

Adaptation to MI Skills to accommodate brain injury:

Open-Ended Questions: Clients may have difficulty answering open-ended questions. It is helpful to provide information in the stem of the question. Rather than "Tell me about your substance use last weekend," it's better to provide information that will serve as a cue. "I know that you were going to visit your aunt, and you expected there to be a party. How did that go?"

Affirmation: Affirmation is particularly important for individuals who may have lost confidence in their abilities. Like many clients, those living with TBI may need direct assistance in identifying strengths, which can then be used as a source of affirmation.

Reflections: The client's response to reflections will help to clarify if they have understood complex reflections or analogies/metaphors. Clients may do best with simple reflections.

Summaries: Summaries should be frequent, brief, and provided in a multi-modal format, using notes or diagrams that are created in a collaborative way. Sessions should begin with a review of previous summaries.

Other recommendations:

- Use written notes, menus of topics, and visual cues to set a clear agenda for sessions.
- The therapist may need to directly influence the course of the conversation by reminding clients of the topic at hand.
- The therapist may ask permission to be more directive. For example, "We both want to make the best use of our time together. If we get off track, how can I let you know? Can we use this agenda to keep us focused?"
- Use the "ZOOM-IN and ZOOM-OUT" technique to elicit information.
- Engage client in taking an active role in planning and intervention.
- Time may be spent supporting a client's willingness to accept or collaboratively create needed environmental support when they are having difficulty in following through with their stated goals.
- Clients may benefit from visual cues, signs, or symbols of their commitment to making a change.
- Clients may find enhancing brain health particularly motivating.

Behavioral Approaches

The use of Contingency Management and interventions that include behavioral analyses has been demonstrated to be very effective in the treatment of substance use disorders, particularly for those clients with co-occurring conditions and those using substances such as cocaine, opioids, and methamphetamine, which are known to directly alter the functioning of the reward circuit.[54, 55] Briefly, Contingency Management programs provide tangible reinforcers such as vouchers, goods, or privileges to clients for reaching concrete targeted behaviors. Behavior-analytic approaches include a systematic analysis to determine what typically precedes the drug-use behavior, how the use unfolds, and what happens as a consequence of the behavior. This information is used to manage the antecedents (what comes before the substance use), as in relapse prevention programs, to identify behaviors that can be increased and would directly compete with the substance use, as in the Community Reinforcement Approach,[56] or to limit the harms associated with use, as in Harm Reduction approaches. Behavioral approaches are particularly helpful for people living with brain injury to support engagement in treatment, as well as the attainment and maintenance of behavioral changes.

Ample evidence exists that the use of contingency-management strategies is effective in increasing treatment retention in varied groups of participants in treatment for substance use[57] and, in particular, in supporting treatment retention in individuals living with brain injury.[58] Supporting engagement early in treatment, either by providing an incentive of a gift card for completing four sessions of assessment and treatment planning or by removing the barriers to attending treatment—such as providing taxi fare or support in problem-solving—resulted in improved treatment retention and outcomes when compared to a pre-intervention motivational interview and attention control. In this case, the active treatments were administered in a single phone call prior to the first session of the intervention.

The success of this simple intervention has been attributed to providing clients with a clear and immediate reason to attend initial sessions.[58] This simplified the cognitive calculation associated with motivation to participate from an unknown and unspecified potential gain related to their substance use or lifestyle to a simple rule: “If I attend, there will be a reward.” When they debriefed clients at the end of the study, they found that clients attributed their motivation to attend the intervention to the relationship they had formed with their therapist and their motivation to achieve treatment goals. In this way, providing an incentive for attending treatment supported engagement. This conversion of extrinsic motivation to more intrinsic motivation has also been observed for other patient populations participating in contingency-management treatment.[59]

To be effective, incentives for participation and/or contingency management need to be carefully constructed. The behavior being reinforced needs to be monitored consistently and in an objective manner, the selected reinforcer needs to be relevant to the program participant, and the reinforcement needs to be provided immediately after the desired behavior is observed and withheld if the behavior is not observed. More information about the ethical and effective use of contingency management can be found in the references and resources at the end of this section.

The Community Reinforcement Approach CRA or Community Reinforcement and Family Training CRAFT[60] is a holistic program that can be initiated before an individual has expressed a desire to alter their substance use. In some cases, the intervention may be initiated by intervening with others in the environment, including family training CRAFT.[61] The primary components of CRA include a behavioral analysis of the substance use behavior with the goal of reducing reinforcers associated with the substance use and increasing the availability of reinforcement resulting from behavior that directly competes with the substance use. Sobriety sampling, skills training, and case management are directed to supporting clients to achieve life goals. Communication strategies designed to reduce the risk of aggression and promote participation in treatment in individuals who may lack awareness of their problematic substance use are also addressed. CRA, along with CRAFT, which includes family training, is a particularly useful model for individuals who may not have an awareness of the need for intervention but have a family member who would be willing to participate in care and learn strategies to promote their family member's engagement. Several aspects of the CRA intervention have been found to be helpful in addressing substance use disorders in individuals living with moderate to severe brain injuries, including intensive case management[62, 63] and skills training.[64]

Considerations for Participation in Mutual Self-Help Groups

Mutual self-help groups can be beneficial for individuals living with cognitive impairments. The benefit of self-help groups may include a venue for making social contacts and extending the availability of aftercare for other programs of treatment; however, there are some important considerations when recommending these to clients.

In general, attendance at self-help groups is most likely to have the desired effect if an individual is able to manage new social situations appropriately, is able to ask for any accommodation that they might need, and has someone who can provide an introduction to the norms of group membership and potentially escort the individual to meetings. Smaller, closed meetings, such as 12-Step study meetings, may be the best place to start. However, people who demonstrate significant difficulty in managing social situations and whose memory is poor seem to have reduced empathy and may find that attending meetings is counterproductive. Consider whether your client would be distracted or triggered by talking about substance use and if they are able to attend to and remember the essential content being offered.

Because people living with brain injury often require long-term support, teaching a client about community based mutual self-help groups such as AA or Smart Recovery may be an important goal of the intervention. This is particularly true if aftercare resources are limited. Preparing a client to participate in groups may include teaching a client about the program the group follows as well as direct discussion about group norms—such as how often to attend, what time to arrive, and what to expect during meetings. It may also include supporting the client to articulate their particular needs to facilitators and other group members. Clients will often require assistance in locating groups. Often clients will benefit from the support of an escort who can encourage them to attend the meeting, provide introductions, as well as explain what is happening in the group. This type of support may be phased out once a client is familiar with the group.

Many programs have “service meetings” that are held in the same setting as a program for substance use disorders but facilitated by a participating mutual self-help member. Service meetings can be adapted to meet the needs of people with neurocognitive impairment by limiting group size to four or five participants, spending a portion of the meeting on reviewing important concepts, and offering the opportunity to share in a more structured fashion with open-ended questions. For example, clients may be asked to share one challenge and one success.

Additional Specialized Care Referrals

When a client presents with a significant cognitive disability, or they appear to be having difficulty in managing day-to-day activity, specialized referrals, where available, will be helpful. Remember that clients may need support in attending required assessments or meeting intake requirements, and appropriate support should be offered.

Case management. Clients with brain injury are likely to have many providers, often from a variety of disciplines and agencies. Therefore, having a team member dedicated to coordinating care will improve client and provider experience and client outcomes. Ideally, the case manager will be familiar with, or work in, the service sector (brain injury, mental health, or addictions) that represents the client's area of greatest need. For example, if cognitive and behavior issues are prominent, it is helpful to have a case manager from the brain injury sector.

Brain injury rehabilitation services. Brain injury services are varied in scope and setting. When brain injury rehabilitation services are affiliated with a hospital, they are typically provided by interdisciplinary teams that include a Psychiatrist, Occupational Therapist, Behavior Therapist, Speech and Language Therapist, Neuropsychiatrist, Nurse, Social Worker, Vocational Rehabilitation Specialist, Psychologist, and Neuropsychologist. Often brain injury support is offered in outpatient clinics and organizations designed to meet the long-term needs of people living with brain injury. Becoming familiar with the services available in your community will be invaluable in accessing needed care. The resource section of this ToolKit provides information about local brain injury groups that can help identify providers in your area.

Pulling It All Together (worked example)

Using a table like the one below will help you to organize your interventions for treatment planning purposes. Consider how your clients' difficulties might impact their ability to participate in treatment and address treatment goals.

	ALERTNESS/ FATIGUE	ATTENTION	PROCESSING	MEMORY	EXECUTIVE COMMUNICATION BEHAVIOR
Observations	Sleepy in appointments after 2 p.m. Often arrives hungry.	Changes topic, distracted by noise.	Gets only part of the message.	Needs reminders for appt. and tasks.	Dominates in groups. Often makes off-color jokes.

GOAL AREA	SUPPORTIVE STRATEGIES
Attendance and participation	Review how to make reminders in phone (set alarm for one hour before appointments). Schedule for morning appointments.
Attention and comprehension	Use notes in session as cue for topic. Take picture for reminder. Slow down/ break down messages.
Learning and remembering new information	Picture of session notes. Review previous session at start of session. Organize information into top two or three things to remember. Repeat key messages.
Following through with tasks	Make specific plans, and help to create reminders in phone or as notes/ posters at home. Break tasks down into small elements. Encourage client to enlist help of family to support follow-up.
Understanding strengths and needs	Use goal setting. Ask client to predict behavior/track progress. Review events, and modify approach as needed.
Setting realistic goals	Encourage client to dream big and start small with a goal that can be done in the next week. Build on most recent success.

Pulling It All Together

Using a table like the one below will help you to organize your interventions for treatment planning purposes. Consider how your clients' difficulties might impact their ability to participate in treatment and address treatment goals.

	ALERTNESS/ FATIGUE	ATTENTION	PROCESSING	MEMORY	EXECUTIVE COMMUNICATION BEHAVIOR
Observations					

GOAL AREA	SUPPORTIVE STRATEGIES
Attendance and participation	
Attention and comprehension	
Learning and remembering new information	
Following through with tasks	
Understanding strengths and needs	
Setting realistic goals	

SECTION 5

RESOURCES

Relevant Publications from SAMHSA

- Substance Abuse and Mental Health Services Administration (2021) "Treating Patients with Traumatic Brain Injury", update from the SMA10-4591, In Brief, Volume 9, Issue 2. https://store.samhsa.gov/product/treating-patients-with-traumatic-brain-injury/PEP21-05-03-001 and https://store.samhsa.gov/product/PEP21-05-03-001

- TIP 29: Substance Use Disorder Treatment for People With Physical and Cognitive Disabilities (SMA) 08-4078 http://store.samhsa.gov/product/TIP-29-Substance-Use-Disorder-Treatment-for-People-With-Physical-and-Cognitive-Disabilities/SMA12-4078

- TIP 42: Substance Use Treatment for Persons with Co-Occurring Disorders. https://store.samhsa.gov/product/tip-42-substance-use-treatment-personsco-occurring-disorders/PEP20-02-01-004

- Substance Abuse Treatment for Persons with Co-occurring Disorders. Quick Guide for Mental Health Professionals. Based on TIP 42. https://store.samhsa.gov/product/Substance-Abuse-Treatment-for-Persons-With-Co-Occurring-Disorders/SMA10-4531

Other Resources

Community Reinforcement Approach (CRA)

- Miller, Meyers, Hiller-Sturmhofel (1999), Alcohol Research and Health. 23, 2, P116-121. https://pubs.niaaa.nih.gov/publications/arh23-2/116-121.pdf

- Manual 2, Community Reinforcement Plus Vouchers Approach: Treating Cocaine Addiction. US Department of Health and Human Services, National Institute of Health. https://archives.drugabuse.gov/sites/default/files/cra.pdf

- Robert Meyers and Daniel Squires, Community Reinforcement Approach: A guideline developed for the Behavioral Health Recovery Management Project https://www.drugsandalcohol.ie/13609/1/NTA_Community_reinforcement_approach.pdf

- Community Reinforcement and Family Training Support and Prevention (CRAFT – SP) https://www.mirecc.va.gov/visn16/docs/craft-sp_final.pdf

- Jane Ellen Smith, and Robert J. Meyers. Motivating Substance Abusers to Enter Treatment : Working with Family Members. The Guilford Press, 2004. EBSCOhost, search-ebscohost-com.proxy.library.umkc.edu/login.aspx?direct=true&db=edsebk&AN=262865&site=eds-live&scope=site.

Brain Injury

- National Institute of Neurological Disorders and Stroke: www.ninds.nih.gov
- About Traumatic Brain Injury and Post Traumatic Stress Disorder: www.brainline.org
- Substance Use and Brain Injury Bridging Project: WWW.SUBI.CA
- TBI Model Systems Knowledge Translation Center: msktc.org/tbi
- Traumatic Brain Injury Technical Assistance and Resource Center: https://www.hsri.org/project/traumatic-brain injury-technical-assistance-and-resource-center
- Brain Injury Association of America: https://www.biausa.org/
- United States Brain Injury Alliance: https://usbia.org/
- National Association of State Head Injury Administrators: https://www.nashia.org/

Cognitive Rehabilitation

- Society for Cognitive Rehabilitation: www.societyforcognitiverehab.org
- Winson, Wilson & Bateman (2017). *Brain Injury Rehabilitation Workbook*. Guilford Press

SECTION 6

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SECTION 7

ACKNOWLEDG-MENTS

About the Mid-America Addiction Technology Transfer Center

The **Mid-America ATTC** serves Health and Human Services Region 7 and includes the states of Iowa, Kansas, Missouri, and Nebraska. Funded by the Substance Abuse and Mental Health Service Administration (SAMHSA), the Center is a collaboration between Truman Medical Center Behavioral Health and the University of Missouri-Kansas City School of Nursing and Health Studies, with a mission to support multidisciplinary practitioners, agencies, and communities in implementing evidence-based practices.

Land Acknowledgment

Mid-America ATTC is located in Kansas City, Missouri. The contributors from Kansas City, MO are standing on the ancestral lands of the Kiikaapoi (Kickapoo), Washtáge Mo^{n}zhá^{n} (Kaw / Kansa), and (Osage) People. The territory expanded into areas now known as Arkansas, Illinois, Iowa, Kansas, Louisiana, Missouri, Nebraska, Oklahoma, Texas, and parts of Kentucky, Ohio, Pennsylvania, and West Virginia. We pay respects to their elders, past and present.

About the Mountain Plains Addiction Technology Transfer Center

The **Mountain Plains ATTC** serves Health and Human Services Region 8 (take out comma here) and includes the states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. Funded by the Substance Abuse and Mental Health Service Administration (SAMHSA), the Mountain Plains ATTC is co-located at the University of North Dakota and the University of Nevada, Reno, with a mission of enhancing substance use disorder treatment and recovery services for individuals and family members, especially those residing in rural and remote areas.

Land Acknowledgment

Mountain Plains ATTC is located in Grand Fork, North Dakota. The contributors from Grand Forks, ND are standing on the ancestral lands of the Anishinaabe/ Ojibwe/ Métis, Assiniboine, Yanktonai, and Očeti Šakówin People. The territory expanded into areas now known as Canada, North Dakota, and Minnesota. We pay respects to their elders, past and present.

About the National Association of State Head Injury Administrators (NASHIA)

NASHIA serves as the leading source of information and education for state employees who support public brain injury programs, NASHIA provides information on national trends, best practices, and state contacts to federal agencies, state and national associations and TBI stakeholders across the country. NASHIA provides technical assistance to state governments and their partners and provides collective representation on federal policy issues through its membership.

Partnership with the National Association of State Head Injury Administrators

The Mid-America ATTC and Mountain Plains ATTC, funded by the Substance Abuse and Mental Health Service Administration, collaborated with the Traumatic Brain Injury Technical Assistance and Resource Center at the National Association of State Head Injury Administrators to provide this toolkit at no charge. Expertise from all Centers inform the content.

About The Author

Carolyn Lemsky, PhD, C Psych ABPP-CN

Dr. Carolyn Lemsky is a board-certified neuropsychologist with more than 25 years of experience working in rehabilitation settings in the U.S. and Canada. She is currently the Clinical Director at Community Head Injury Resource Services (CHIRS) of Toronto—a Ministry of Health and Long-Term Care funded agency designed to promote community re-integration of persons living with the effects of acquired brain injury. CHIRS is home to the Neurbehavioural Intervention Team (NBIP), a specialized service supporting the needs of people living with acquired brain injury, high risk substance use and serious mental health conditions. At CHIRS she maintains an active clinical practice, along with her administrative, research, and training activities. Dr. Lemsky also provides clinical direction to the Substance Use and Brain Injury Bridging Project, a research and knowledge-transfer initiative initially funded by the Ontario Neurotrauma Foundation and the Ontario Ministry of Health. Along with her partners at the Center for Addictions and Mental Health (CAMH), Dr. Lemsky has provided consultation and training to service providers in mental health, substance use and rehabilitation settings across Canada and the US. In addition to frequent conference presentations, Dr. Lemsky has contributed book chapters and articles to the neuropsychology and brain injury literature.

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Disclaimer Statement

The work of the Mid-America ATTC is supported by SAMHSA grant #1H79TI080208. The work of the Mountain Plains ATTC is supported by SAMHSA grant #5UR1T1080200.

Portions of this toolkit are a revision of the 2007 Provider Manual originally funded by the Substance Use and Brain Injury Project (Grant #G03-05465) provided through the Ontario Ministry of Health and Long-Term Care from Health Canada's Primary Health Care Transition Fund. The author wishes to acknowledge the contributions of the Substance Use and Brain Injury team including Tim Godden, Jerry Schwalb, Dennis James, and Heather Chisvin for their contributions to that earlier work. She would also like to thank The Neurobehavioural Intervention Team members at Community Head Injury Resource Services of Toronto as well as Dr. John Corrigan, Dr. Jennifer Bogner and Dr. Peter Selby for their generous advice and support in developing the original materials. Additionally, portions of this toolkit are an update of materials originally developed by the Substance Use and Brain Injury Bridging Project (www.SUBI.Ca), housed at Community Head Injury Resource Services of Toronto and funded by the Ontario Neurotrauma Foundation. Finally, the toolkit was informed by the work of Dr. John Corrigan and Dr. Jennifer Bogner and their team at the Ohio Valley Center for Brain Injury Prevention and Rehabilitation. https://wexnermedical.osu.edu/neurological-institute/departments-and-centers/research-centers/ohio-valley-center-for-brain-injury-prevention-and-rehabilitation

SECTION 8

MID-AMERICA AND MOUNTAIN PLAINS ATTC RESOURCES

The Mid-America and Mountain Plains Addiction Technology Transfer Centers (ATTCs) partnership with the National Association of State Head Injury Administrators (NASHIA) offers seven recorded offerings, with nationally recognized content experts, that focus on the intersection between brain injury and substance use disorders to include content on suicide, interpersonal violence, group/individual therapy implications in treatment, co-occurring disorders, justice-involved populations, family involvement, and basics of TBI and SUD.

You can access this content to include PowerPoint slides and recorded pieces of training about various topics of importance to behavioral health providers, particularly those working with people with substance use disorders, at the Mid-America ATTC website (www.attcnetwork.org/midamerica). This toolkit builds and expands on this content.

Traumatic Brain Injury and Substance Use Disorders:
Brain Injury 101 TBI & SUD: The Basics
This content provides an overview of brain injury, including information on what brain injury basics and the prevalence within the general population in the context of high-risk populations. It includes content on screening tools and strategies for supporting individuals with brain injury within substance use disorder treatment settings.

Traumatic Brain Injury and Substance Use Disorders:
Intimate Partner Violence (IPV), TBI & SUD
This content introduces the role of intimate partner violence and other abusive tactics—specifically mental health and substance use coercion--as additional drivers of substance misuse and addiction. A critically important consequence of IPV has been hidden in plain sight for decades—brain injury.

Traumatic Brain Injury and Substance Use Disorders:
The Intersection of Brain Injury, Suicide, and Addiction TBI & SUD: Suicide and Addiction
This content explores the relationship between suicide, TBI, and comorbid substance use. Research findings are presented as well as content regarding the brain mechanisms that may mediate this relationship.

Traumatic Brain Injury and Substance Use Disorders:
Part 1: Implications of Traumatic Brain Injury & Addiction

This content introduces the various physical, cognitive, and emotional issues related to this combination of disorders. Content on prevalence and scope of the problem of TBI and SUD is reviewed along with a full description of brain function, cognitive assessment, various modifications to the usual rehabilitation approach, and long-term care.

Traumatic Brain Injury and Substance Use Disorders:
Part 2: Effective Strategies for Group & Individual Therapy

This content examines the executive dysfunction and the process of applying standard SUD treatment to people with executive function difficulty and suggests modifications to the usual rehabilitation approaches.

Brain Injury and Substance Use Disorders: Implications for Justice-Involved:
Focus on Justice-Involved Persons with TBI & SUD

This content provides an overview of brain injury and co-occurring mental health and substance use disorders in justice settings. Content includes information on psycho-education approaches in serving this population plus accommodations and supports to improve client outcomes.

Traumatic Brain Injury and Substance Use Disorders:
Importance of Family Involvement in Treatment

This content describes the complex dilemma families find themselves in when a loved one develops the additional problem of a substance use issue. The impact of SUD on TBI recovery is reviewed, and the impact of SUD on ongoing cognitive and physical rehabilitation.

Brain Injury and Substance Use Disorders:
Implications of Use of Stimulants on Traumatic Brain Injury

This content provides a review of the pharmacological characteristics of stimulant medication and medications that provide a stimulant effect and reviews which medications are most effective in enhancing natural recovery and improving fatigue and cognitive functioning when a traumatic brain injury has occurred.

Notes

Mid-America (HHS Region 7)

ATTC Addiction Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

Mountain Plains ATTC (HHS Region 8)

ATTC Addiction Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

SAMHSA
Substance Abuse and Mental Health Services Administration

NATIONAL ASSOCIATION OF STATE HEAD INJURY ADMINISTRATORS