

Considerations & Best Practices for Diagnostic Procedures

Epidemiology of psychiatric disorders

People with traumatic brain injury (TBI) present with a range of psychiatric disorders and often at a higher rate than the general population. Common diagnoses include mood disorders (major depressive, dysthymic and bipolar disorder), anxiety disorders (generalized anxiety, post-traumatic stress, obsessive-compulsive, panic, acute stress disorders, and agoraphobia and social phobia), psychotic disorders, and substance use disorders. People with TBI may also present with personality changes (apathy, affective lability, aggression, behavioral disinhibition), impaired self-awareness, suicidality, and socially inappropriate behavior.

Children and adolescents experience many of the same emotional and behavioral difficulties post-TBI as adults, with children most commonly experiencing depression, anxiety, personality changes (affective instability, aggression, disinhibited behavior, and apathy), psychosis/paranoia, secondary attention-deficit/hyperactivity disorder, oppositional defiant disorder/conduct disorder, posttraumatic stress disorder and mania/hypomania.

Risk of misdiagnosis

People with TBI may seek mental health services, either without disclosing their TBI status to the

provider or without inquiring whether the provider has familiarity with the clinical profile of TBI. As a result, they may not be accurately diagnosed. A proper diagnosis is essential for effective treatment. Misdiagnosis can occur because the presenting psychiatric symptoms are not considered in the context of TBI but are instead diagnosed in isolation. For example, people with TBI may experience emotional lability and behavioral dysregulation because of disruption in their executive functions. These symptoms, however, may resemble those of bipolar disorder. If a person with TBI is diagnosed with bipolar disorder, they may receive inappropriate and ineffective treatment, which may also have a negative impact on the provider's prognosis and the patient's experience with the mental health system.

Neurological vs. psychogenic causes

The origins of the emotional and behavioral symptoms that people with TBI present may be neurological or psychogenic in origin. Symptoms could be caused by the direct impact of the injury on neurological functioning (e.g., lesions, axonal damage, infection, neurochemical disruption, cerebrovascular changes). However, symptoms could also be psychogenic in nature. In this case, depression may be a reaction to the broader losses a person with TBI experienced after the injury: loss of autonomy and independence, loss of employment and income, or loss of social connections and outlets.

Psychiatric Diagnostic Assessments of People with TBI

1. Read aloud instructions for the patient.
2. Ask the patient to repeat instructions to ensure they understand.
3. Read the items of a self-administered measure to the patient and record their responses.
4. Obtain corroborating information from significant others.

While it may not be possible to accurately identify the cause of the emotional or behavioral disturbance, it is important that both be explored and addressed. Focusing on either the neurological or the psychological while ignoring the other may render the treatment ineffective. In pediatric TBI, the interaction between brain dysfunction and ongoing developmental processes can impact the onset and presentation of symptoms and further complicate diagnosis and treatment decisions.

Administering diagnostic instruments

Diagnostic methods and procedures do not generally differ for patients with TBI. Similar to other clinical populations, an in-depth interview with the patient and collateral sources, clinical observations, and use of screening and assessment tools and measures are ideal in helping providers make accurate diagnoses. Mental health providers already use many of the screening and assessment tools recommended in assessing mental health difficulties for those with TBI (e.g., SCAT-5, BDI-II, BAI, MMPI-2). However, it is important for providers to understand the limitations of these measures when used in a TBI population.

Reduced cognitive functioning after TBI can complicate the diagnostic process. Problems with attention, short- and long-term memory, reading comprehension, or verbal fluency may render a diagnosis incomplete or invalid. These cognitive challenges may impact a patient's ability to provide accurate information during a clinical interview and/or their ability to complete assessments.

Selection of diagnostic instruments

Asking the client during the interview if they experience any cognitive challenges in daily life, as well as completing a brief cognitive screening measure (e.g., the Montreal Cognitive Assessment [MoCA], Mini-Mental Status Exam [MMSE]) could help identify any potential cognitive challenges and determine if a referral for a more thorough neuropsychological assessment would facilitate diagnosis and treatment. If cognitive deficits are suspected, referral to a neuropsychologist is recommended.

A comprehensive neuropsychological evaluation can help providers better understand the client's cognitive challenges and how they might impact psychological functioning. If screening measures

such as MoCA or the MMSE will be used, the provider is encouraged to receive training in their administration.

Listed below are resources available to clinicians to facilitate the selection of measures and tools when assessing psychological outcomes post-TBI. These resources include adult and pediatric measures to assess psychiatric disorders in clinical settings. They also provide information about the validity limitations of the measures in the population, domains, and measures of common data elements.

Helpful Resources for Clinicians

- The National Institute of Neurological Disorders and Stroke (NINDS) Common Data Elements (CDE). (n.d.). *Traumatic Brain Injury*.
www.commondataelements.ninds.nih.gov/Traumatic%20Brain%20Injury#pane-89
- Searchable database of instruments for clinicians and researchers for various medical conditions, including TBI. Shirley Ryan AbilityLab (2022). *Rehabilitation measures database*.
www.sralab.org/rehabilitation-measures

Considerations & Best Practices for Clinical Interventions

Delivering treatment to people with TBI

1. Cognitive impairments. People with TBI may experience reduced cognitive functioning that ranges in duration and severity. While specific cognitive rehabilitation interventions exist to target problems in cognitive functions like attention, memory, and executive functioning, TBI-related cognitive deficits can interfere with the effectiveness of mental health services when these services are not combined with cognitive rehabilitation.

2. Impaired self-awareness. People with TBI may present with deficits in self-awareness, which could range from anosognosia (lack of awareness that mental functions are impaired and disruptive to daily functioning) to poor anticipation of consequences (unable to predict that a certain maladaptive behavior will cause further problems).

It is important for providers to a) assess the level of self-awareness through standard measures or collateral interviews with caregivers and/or other providers, and b) determine whether self-awareness is the target or a by-product of treatment. It is not uncommon to expect that as self-awareness increases, psychiatric symptoms may be exacerbated as the person becomes more cognizant of the challenges and losses incurred due to TBI.

Modifying Existing Interventions

The tables that follow show challenges related to brain injury and recommendations on how to modify the provider’s approach to accommodate for the impairment.

CHALLENGES	RECOMMENDATIONS
<p>Remembering appointments.</p> <p>Memory problems may prevent people with TBI from keeping their scheduled appointments. Skipping appointments may be disruptive for the continuity of care and may also be a source of frustration for providers.</p>	<ul style="list-style-type: none"> • Encourage consistent use of a calendar, set up alerts and reminders on a smartphone, send reminder emails or texts, and explore other memory aids (e.g., sticky notes).
<p>Remembering content of sessions.</p> <p>Memory problems may make it difficult to recall the content of a session between visits. People with TBI may fail to apply and generalize the insights gained and coping skills demonstrated during sessions beyond the therapeutic context. As a result, the presenting problems may persist, requiring extended duration of treatment.</p>	<ul style="list-style-type: none"> • Break down important information into manageable chunks and summarize the highlights of a session. • Encourage the client to keep a journal to record these highlights. • Help them enter the information in the journal at the end of the session and review the entry at the beginning of the next session.
<p>Remembering to do homework.</p> <p>Assigning homework is important for skill transfer and generalization. Memory problems may interfere with the completion of homework assignments because the client may forget about an assignment or its specific requirements.</p>	<ul style="list-style-type: none"> • If homework is assigned, ensure it is assigned consistently (e.g., for every session), as opposed to sporadically. • Provide clear instructions and ensure the client understands the assignment. • Have the client write down instructions somewhere that increases the probability they will locate the information between sessions (e.g., session journal, calendar, to-do list, homework notebook). • Review the assigned homework during the following session to make it an integral component of the session. • If possible, send an email or text reminder ahead of time to check progress on the homework.

CHALLENGES	RECOMMENDATIONS
<p>Staying focused.</p> <p>Challenges with sustained attention may make it difficult to stay focused for prolonged periods during the session. People with TBI may drift in and out of the session, may miss important points due to inattention, or may become mentally fatigued more easily.</p>	<ul style="list-style-type: none"> • Make sessions shorter. • Give breaks during the session. • Periodically check in with the client to ensure they remain focused.
<p>Easily distracted.</p> <p>Clients may be easily distracted by extraneous triggers, such as sounds, movements, or objects in the environment, which will interfere with their focus on session content.</p>	<ul style="list-style-type: none"> • Hold sessions in a less visually “busy” setting (e.g., have the client face wall art instead of a crowded bookshelf). • Reduce the amount of ambient noise or sounds that might distract the client.
<p>Slow rate of comprehension.</p> <p>Reduced processing speed may interfere with how quickly a person with a TBI can understand a complex concept or learn a skill.</p>	<ul style="list-style-type: none"> • Engage in slower and more deliberate communication. • Use multiple modalities to present information and repeat concepts and instructions.
<p>Slow rate of response.</p> <p>Slow processing speed leads to delays in responding because more time is required to access information from long-term memory, organize thoughts and ideas, and formulate a response.</p> <p>This may be frustrating to the provider and may make the client seem more impaired or less engaged.</p>	<ul style="list-style-type: none"> • Allow clients ample time to respond to a question or to describe an event or experience. Indicate that there is no pressure to provide a response quickly.
<p>Difficulty making decisions.</p> <p>People with TBI often report feeling “stuck” because they have difficulty engaging in problem-solving and decision-making.</p> <p>They may present as overthinking a problem or, conversely, avoiding a task or abandoning a goal.</p>	<ul style="list-style-type: none"> • Help the client clarify the decision to be made. • Facilitate decision-making by using strategies like a “pros and cons” analysis. • Engage the client in an evidence-based problem-solving approach. Help the client generate viable choices.

CHALLENGES	RECOMMENDATIONS
<p>Difficulty initiating behavior.</p> <p>People with TBI may have difficulty initiating conversations and bringing up relevant topics.</p> <p>They may fail to follow through with homework assignments or to practice recommended coping strategies.</p>	<ul style="list-style-type: none"> • Make sessions more structured (e.g., set up a Q&A format). • Ask clients (or family, if relevant) to keep notes or compile questions during the week, which can provide content for the session and help recall. • Set up motivators that encourage clients to complete tasks.
<p>Easily overwhelmed.</p> <p>People with TBI may feel easily overwhelmed and experience cognitive “flooding,” even in the presence of minimal stressors. They may have difficulty accomplishing daily tasks because of the distress.</p>	<ul style="list-style-type: none"> • Focus on just a few topics during sessions. • Encourage the use of to-do lists. • Recommend against engaging in multitasking. • Teach relaxation and mindfulness techniques.
<p>Photosensitivity.</p> <p>People with TBI may present with sensitivity to bright lights, which may interfere with their ability to focus.</p>	<ul style="list-style-type: none"> • Adjust the lighting in the room or encourage the person to wear photoprotective gear, such as sunglasses or visors.
<p>Fatigue.</p> <p>Both physical and cognitive fatigue can interfere with treatment. The physical effort of traveling to the treatment setting may affect attendance and participation. The client may only be able to process a limited amount of information.</p> <p>It is not uncommon for people with TBI to feel fatigued for several days after a day of strenuous physical or mental activity.</p>	<ul style="list-style-type: none"> • Make sessions shorter. • Give breaks. • Help clients manage their activity level to prevent the onset of debilitating fatigue. • Schedule manageable treatment-related activities between sessions.
<p>Alexithymia.</p> <p>The neurological impairment of the brain injury may leave a person with TBI unable to recognize, process, and be aware of their own affective responses. In addition, they may misread or ignore emotional cues in other people.</p>	<ul style="list-style-type: none"> • Be cautious not to interpret lack of emotional awareness as a psychiatric symptom (e.g., anhedonia) or as an attempt of denial. • Inquire about the person’s emotional state without expecting them to accurately label their emotions. • If possible, focus the treatment on increasing emotional awareness.

Evidenced-based Mental Health Treatments for People with TBI

While existing interventions could be modified for delivery to people with TBI, research involving people with TBI has yielded several evidence-based practices for a range of psychiatric disorders, some of which are included below.

Adults

- Cognitive behavioral therapy for post-TBI depression.^{1,2,3}
- Mindfulness-based cognitive therapy for post-TBI depression.⁴
- Modified cognitive behavioral therapy (CBT plus motivational interviewing and/or nondirective counseling) for post-TBI depression and anxiety.⁵
- Cognitive behavioral therapy for post-TBI hopelessness.⁶
- Acceptance and commitment therapy for post-TBI psychological distress.⁷
- Goal management training (with external cuing and an emotional regulation module) improves post-TBI emotion-regulation skills and quality of life.⁸
- Emotion-regulation intervention for post-TBI emotion dysregulation.⁹

Children

- Prolonged exposure treatment for children with post-TBI post-traumatic stress disorder (PTSD).¹⁰
- Problem-solving treatment program for post-TBI

psychosocial functioning (adolescent internalizing behavior and depressive symptoms).¹¹

- Cognitive behavioral therapy for post-TBI psychological adjustment (self-management and compliance).¹²
- Positive parenting skills program for post-TBI child behavior and parenting skills.¹³

Couples or caregivers of adults and children

- Problem-solving family intervention reduces psychological distress for caregivers of adolescents with TBI.¹⁴
- TBI caregiver intervention for improving emotional, instrumental, and professional support, and brain injury knowledge.¹⁵
- Family intervention for parental distress following pediatric TBI.¹⁶
- Online problem-solving program for teens to improve problem-solving skills and reduce depressive symptoms for caregivers.¹⁷
- Problem-solving intervention for improving self-efficacy and depression for caregivers of adolescents with TBI.¹⁸
- Parenting skills program for psychological distress for caregivers of children with TBI.¹⁹
- Parenting intervention for depression for caregivers of children with TBI.²⁰
- Therapeutic couples intervention for reducing unmet needs and burdens for caregivers following TBI.²¹
- Couples intervention for improving dyadic adjustment and communication.²² 

Source

Content for this brief was drawn from Section V. Modifying Clinical Interventions for TBI, of the Administration for Community Living. 2022. [Behavioral Health Guide: Considerations for Best Practices for Children, Youth, and Adults with TBI \(acl.gov\)](#). The section was written by Theo Tsaousides, PhD, ABPP, clinical assistant professor, and Maria Kajankova, PhD, assistant professor, Department of Rehabilitation and Human Performance, Icahn School of Medicine at Mount Sinai. The Traumatic Brain Injury Technical Assistance and Resource Center is funded by the Administration for Community Living. The Human Services Research Institute and the National Association of State Head Injury Administrators administer it. For more information, visit: [Traumatic Brain Injury \(TBI\) | ACL Administration for Community Living](#).

References

- ¹ Ashman, T., Cantor, J. B., Tsaousides, T., Spielman, L., & Gordon, W. (2014). Comparison of cognitive behavioral therapy and supportive psychotherapy for the treatment of depression following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 29(6), 467–478. <https://doi.org/10.1097/htr.0000000000000098>
- ² Fann, J. R., Bombardier, C. H., Vannoy, S., Dyer, J., Ludman, E., Dikmen, S., Marshall, K., Barber, J., & Temkin, N. (2015). Telephone and in-person cognitive behavioral therapy for major depression after traumatic brain injury: A randomized controlled trial. *Journal of Neurotrauma*, 32(1), 45–57. <https://doi.org/10.1089/neu.2014.3423>
- ³ Topolovec-Vranic, J., Cullen, N., Michalak, A., Ouchterlony, D., Bhalerao, S., Masanic, C., & Cusimano, M. D. (2010). Evaluation of an online cognitive behavioural therapy program by patients with traumatic brain injury and depression. *Brain Injury*, 24(5), 762–772. <https://doi.org/10.3109/02699051003709599>
- ⁴ Bédard, M., Felteau, M., Marshall, S., Cullen, N., Gibbons, C., Dubois, S., Maxwell, H., Mazmanian, D., Weaver, B., Rees, L., Gainer, R., Klein, R., & Moustgaard, A. (2014). Mindfulness-based cognitive therapy reduces symptoms of depression in people with a traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 29(4). <https://doi.org/10.1097/htr.0b013e3182a615a0>
- ⁵ Ponsford, J., Lee, N. K., Wong, D., McKay, A., Haines, K., Alway, Y., Downing, M., Furtado, C., & O'Donnell, M. L. (2015). Efficacy of motivational interviewing and cognitive behavioral therapy for anxiety and depression symptoms following traumatic brain injury. *Psychological Medicine*, 46(5), 1079–1090. <https://doi.org/10.1017/s0033291715002640>
- ⁶ Simpson, G. K., Tate, R. L., Whiting, D. L., & Cotter, R. E. (2011). Suicide prevention after traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 26(4), 290–300. <https://doi.org/10.1097/htr.0b013e3182225250>
- ⁷ Sander, A. M., Clark, A. N., Arciniegas, D. B., Tran, K., Leon-Novelo, L., Ngan, E., Bogaards, J., Sherer, M., & Walser, R. (2020). A randomized controlled trial of acceptance and commitment therapy for psychological distress among persons with traumatic brain injury. *Neuropsychological Rehabilitation*, 31(7), 1105–1129. <https://doi.org/10.1080/09602011.2020.1762670>
- ⁸ Tornås, S., Løvstad, M., Solbakk, A.-K., Schanke, A.-K., & Stubberud, J. (2016). Goal management training combined with external cuing as a means to improve emotional regulation, psychological functioning, and quality of life in patients with acquired brain injury: A randomized controlled trial. *Archives of Physical Medicine and Rehabilitation*, 97(11). <https://doi.org/10.1016/j.apmr.2016.06.014>
- ⁹ Tsaousides, T., Spielman, L., Kajankova, M., Guetta, G., Gordon, W., & Dams-O'Connor, K. (2017). Improving emotion regulation following web-based group intervention for individuals with

-
- Traumatic Brain Injury. *Journal of Head Trauma Rehabilitation*, 32(5), 354–365.
<https://doi.org/10.1097/htr.0000000000000345>
- ¹⁰ Shorer, M., Segev, S., Rassovsky, Y., Fennig, S., Apter, A., & Peleg, T. P. (2020). Efficacy of psychological intervention for children with concurrent posttraumatic stress disorder and mild traumatic brain injury. *Journal of Traumatic Stress*, 33(3), 330–337.
<https://doi.org/10.1002/jts.22512>
- ¹¹ Wade, S. L., Walz, N. C., Carey, J. A. C., & Williams, K. M. (2008). Preliminary efficacy of a web-based family problem-solving treatment program for adolescents with traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 23(6), 369–377.
<https://doi.org/10.1097/01.htr.0000341432.67251.48>
- ¹² Wade, S. L., Carey, J., & Wolfe, C. R. (2006). An online family intervention to reduce parental distress following pediatric brain injury. *Journal of Consulting and Clinical Psychology*, 74(3), 445–454.
<https://doi.org/10.1037/0022-006x.74.3.445>
- ¹³ Antonini, T. N., Raj, S. P., Oberjohn, K. S., Cassedy, A., Makoroff, K. L., Fouladi, M., & Wade, S. L. (2014). A pilot randomized trial of an online parenting skills program for pediatric traumatic brain injury: Improvements in parenting and child behavior. *Behavior Therapy*, 45(4), 455–468.
<https://doi.org/10.1016/j.beth.2014.02.003>
- ¹⁴ Petranovich, C. L., Wade, S. L., Taylor, H. G., Cassedy, A., Stancin, T., Kirkwood, M. W., & Maines Brown, T. (2015). Long-term caregiver mental health outcomes following a predominately online intervention for adolescents with complicated mild to severe traumatic brain injury. *Journal of Pediatric Psychology*, 40(7), 680–688. <https://doi.org/10.1093/jpepsy/jsv001>
- ¹⁵ Niemeier, J. P., Kreutzer, J. S., Marwitz, J. H., & Sima, A. P. (2019). A randomized controlled pilot study of a manualized intervention for caregivers of patients with traumatic brain injury in inpatient rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 100(4).
<https://doi.org/10.1016/j.apmr.2018.07.422>
- ¹⁶ Wade, S. L., Carey, J., & Wolfe, C. R. (2006). An online family intervention to reduce parental distress following pediatric brain injury. *Journal of Consulting and Clinical Psychology*, 74(3), 445–454.
<https://doi.org/10.1037/0022-006x.74.3.445>
- ¹⁷ Wade, S. L., Walz, N. C., Carey, J. A., McMullen, K. M., Cass, J., Mark, E., & Yeates, K. O. (2012). A randomized trial of teen online problem solving: Efficacy in improving caregiver outcomes after brain injury. *Health Psychology*, 31(6), 767–776. <https://doi.org/10.1037/a0028440>
- ¹⁸ Wade, S. L., Karver, C. L., Taylor, H. G., Cassedy, A., Stancin, T., Kirkwood, M. W., & Brown, T. M. (2014). Counselor-assisted problem solving improves caregiver efficacy following adolescent brain injury. *Rehabilitation Psychology*, 59(1), 1–9. <https://doi.org/10.1037/a0034911>
- ¹⁹ Raj, S. P., Antonini, T. N., Oberjohn, K. S., Cassedy, A., Makoroff, K. L., & Wade, S. L. (2015). Web-based parenting skills program for pediatric traumatic brain injury reduces psychological distress among lower-income parents. *Journal of Head Trauma Rehabilitation*, 30(5), 347–356.
<https://doi.org/10.1097/htr.0000000000000052>
- ²⁰ Raj, S. P., Shultz, E. L., Zang, H., Zhang, N., Kirkwood, M. W., Taylor, H. G., Stancin, T., Yeates, K. O., & Wade, S. L. (2018). Effects of Web-based parent training on caregiver functioning following pediatric traumatic brain injury: A randomized control trial. *Journal of Head Trauma Rehabilitation*, 33(6). <https://doi.org/10.1097/htr.0000000000000388>
- ²¹ Graham, K. M., Kreutzer, J. S., Marwitz, J. H., Sima, A. P., & Hsu, N. H. (2020). Can a couples' intervention reduce unmet needs and caregiver burden after brain injury? *Rehabilitation Psychology*, 65(4), 409–417. <https://doi.org/10.1037/rep0000300>
- ²² Backhaus, S., Neumann, D., Parrott, D., Hammond, F. M., Brownson, C., & Malec, J. (2019). Investigation of a new couples intervention for individuals with brain injury: A randomized controlled trial. *Archives of Physical Medicine and Rehabilitation*, 100(2).
<https://doi.org/10.1016/j.apmr.2018.08.174>