



**Department of Health | Office of Mental Health  
Office of Addiction Services and Supports**

# **Brain Injury Grand Rounds**

**BRAIN INJURY 101: UNDERSTANDING AND IDENTIFYING BRAIN INJURY**

**March 31, 2026**

# AGENDA

- Introductions
- Guest speaker presentations
- Case discussion



Moderated by:



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Services  
NYS Office of Mental Health

# BRAIN INJURY 101: UNDERSTANDING AND IDENTIFYING

## BRAIN INJURY



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# WEBINAR PARTICIPATION

- Please use the Q&A section for any questions
- To turn on/off the live transcription, use the closed captions option on the bottom bar
- This webinar is being recorded, and accreditation is only available for the live session



# ACCREDITATION INFORMATION

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This course is approved for CASAC/ CPP/ CPS Renewal clock hours.



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# OPENING REMARKS

## Dr. Ann Marie T. Sullivan, Commissioner of NYS Office of Mental Health



<https://youtu.be/8Dg4BsfXOhA>

# OUTLINE AND OBJECTIVES

- Definitions, Epidemiology, and Pathophysiology
- Screening and Diagnosis
- Symptoms & Sequelae, Recovery, and Prognosis
- Case Discussion

## **Learning Objectives:**

Learners will be able to identify types of brain injury and recognize their clinical signs.

Learners will be able to understand the pathophysiology and common symptomologies of brain injury



# Definitions, Epidemiology, and Pathophysiology

Presented by: Dr. Brian Im

## Definitions

**Acquired Brain Injury**

**Traumatic Brain Injury**

**Anoxic/Hypoxic Brain Injury**

Causes of Brain Injury include:

**Trauma**

**Strokes**

**Spontaneous Brain Bleeds**

**Infection**

**Anoxia (Cardiac Arrest)**

**Hypoxia Ischemic**

**Neoplasm**

**Intracranial Surgery**

**Radiation Treatment**

**Structural abnormality**

**Hydrocephalus**

**Degenerative Neurological Disorders**

**Metabolic/Toxic Effects**

**Seizures**

# Definitions in TBI

## Primary injury (direct impact)

### Intracranial hemorrhages or hematomas

Epidural hematomas

Subdural hematomas

Subarachnoid hematomas

### Intracerebral or intraventricular hematomas

### Brain contusions and lacerations

### Penetrating injury

### Skull fractures

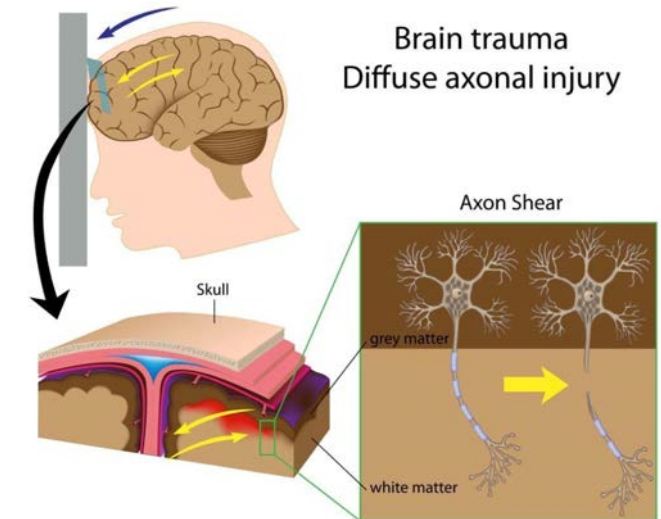
### Cranial nerve damage

### Diffuse axonal injury (DAI)

Due to shearing forces resulting from linear and rotational acceleration and deceleration which puts strain on the brain!

Occurs at gray white matter junction

Not easily seen on imaging



# Definitions in TBI

## Secondary injury

- Cascade of biochemical changes → further neuronal injury
- Occurs days to weeks after

## Cerebral Swelling and Edema

## Hypoxic-Ischemic Damage

## Metabolic Damage

## Epidemiology: Costs of TBI

Approximately 2% of the U.S. population has a long-term or lifelong need for help to perform ADL's as a result of a TBI, according to the CDC.

Direct and indirect costs of TBI?: ~\$60 billion in the United States in 2000.

# Epidemiology: TBI in the USA

- **At least 2.8 million TBI annually** (likely an underestimate)
- **Prevalence:**
  - **Age:**
    - Highest incidence in persons 15-24 years and  $\geq 75$  years
    - Additional peak in children  $\leq 5$  years
  - **Sex:** M > F
- **Most Common Causes of TBI:**
  - Falls (#1 cause of TBI, especially in the elderly)
  - Firearm related suicide (#1 cause of TBI related deaths)
  - MVA
  - Violence/Assault
  - Blast injury is a leading cause of TBI among active military personnel in war zones.

**The number reported with TBI underestimates the magnitude of the problem because the following are not included:**

TBIs undiagnosed or misdiagnosed

Those treated solely within the armed forces medical system

Those treated by private physicians

Individuals who did not seek medical care

# “Invisible epidemic”

**87% of older adults screening positive for TBI had never received a prior TBI diagnosis**

Particularly pronounced in substance use, incarcerated, and psychiatric disorder populations

## **Epidemiology: The TBI-Substance Use Bidirectional Relationship:**

- Dramatically overrepresented in substance use populations
  - 10-fold higher prevalence than the general population
- TBI may increase vulnerability to further substance use
- Individuals with TBI in substance use treatment show greater harm:
  - Higher overdose risk
  - More severe substance use problems
  - Increased use of high-risk substances (amphetamines, cocaine, fentanyl)
  - Riskier routes of administration

**Bidirectional relationship also exists between TBI and psychiatric illness**

## Why This Matters

- Diagnosis is critical for getting the right help
- Functional outcomes
- Treatment engagement
- Risk of repeat TBI/ Relapse risk
- Getting access to the right resources

# Definitions: Anoxic vs. Hypoxic-Ischemic Brain Injury

## Anoxic Brain Injury



Complete absence of oxygen delivery

## Hypoxic-Ischemic Brain Injury



Reduced oxygen delivery (hypoxia) and reduced blood flow (ischemia)

## **Anoxic / Hypoxic-Ischemic Brain Injury**

### **Causes include:**

- **Heart attack (MI)**
- **Substance use overdose**
- **Strangulation**
- **Respiratory failure**

### **Diffuse brain injury**

**Watershed areas of the brain more susceptible to injury**

# Diagnosis and Screening

## Indications for Medical Evaluation



- Neck pain or tenderness
- Double vision
- Weakness or sensory changes
- Increasing or severe headache
- Seizure
- Loss of consciousness (LOC)
- Worsening mental state or arousal
- Vomiting
- Agitation or restlessness

## Observable Signs



- Not moving
- Balance deficits
- Confusion
- Blank stare
- Facial injury
  
- Also GCS<15 or other focal neurological deficits warrant further medical evaluation

## TBI Severity

<b>TBI severity</b>	<b>GCS score</b>	<b>Length of LOC</b>	<b>Duration of PTA</b>
Mild TBI	GCS 13-15	LOC $\leq$ 30 min	PTA $\leq$ 24 hrs
Moderate TBI	GCS 9-12	LOC 30 min - 24 hrs	PTA 1-7 days
Severe TBI	GCS 3-8	LOC $>$ 24 hrs	PTA $>$ 7 days

*\*PTA=Post-Traumatic Amnesia*

**There is a Recent Shift Toward a More Comprehensive Classification Process for TBI**

## Diagnosis & Screening: Imaging

- Non-contrast CT of the head is study of choice for **initial acute** TBI evaluation
  - Relatively quick study
  - Assesses for **acute** findings that require intervention
  - Not always necessary
  - Mild TBI cases often do not show positive findings

# Altered Level of Consciousness

**Coma**

**Unresponsive Wakefulness State**

**Minimally Conscious State**

**JFK Coma Recovery Scale – Revised**

Scale used to assess for emergence from UWS to MCS

# Diagnosis & Screening: Concussion

## Acute/Sideline Settings (within 72 hours):

- **SCAT6** for adults and adolescents  $\geq 13$  years
- **Child SCAT6** for children 8-12 years
- Components: symptom evaluation, cognitive assessment (SAC), balance, neurological screening

## Office/Outpatient Settings (>1 week post-injury):

- **SCOAT6** - identifies specific treatment targets: vestibular dysfunction, cervical issues, mental health concerns, sleep disorders

## SAC Symptom Scale

How do you feel?

"You should score yourself on the following symptoms, based on how you feel now."

	None	Mild	Moderate	Severe			
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or anxious	0	1	2	3	4	5	6

Total number of symptoms (maximum possible 22)

Symptom severity score (maximum possible 132)

A

Echemendia, R. J., Meeuwisse, W., McCrory, P., Davis, G. A., Putukian, M., Leddy, J., Makdissi, M., Sullivan, S. J., Broglio, S. P., Raftery, M., Schneider, K., Kissick, J., McCrea, M., Dvořák, J., Sills, A., Aubry, M., Engebretsen, L., Loosemore, M., Fuller, G., ... Herring, S. (2017). *Sport Concussion Assessment Tool - 5th Edition*. *British Journal of Sports Medicine*, 51(11), 851-858. <https://doi.org/10.1136/bjsports-2017-097506SCAT5>

# Diagnosis & Screening

## Community Settings: Screening Tests for hx of TBI

- OSU TBI-ID:** For lifetime TBI history screening. Detects 50% more TBIs than brief screens. **Specifically includes questions about loss of consciousness from drug overdose**
- Brain Injury Screening Questionnaire (BISQ):** Structured questionnaire that characterizes incidence and severity of lifetime exposure to head trauma and TBI.
- Brain Injury Screening Tool (BIST):** 15-item tool with excellent validity for determining need for specialist referral

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

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. © Reserved 2007, The Ohio Valley Center for Brain Injury Prevention and Rehabilitation

# Symptoms & Sequelae, Recovery, and Prognosis

Presented by: Dr. Jessica Rivetz

## Possible Medical/Neurological Complications Associated with Brain Injury

Increases in intracranial pressure (ICP)

Post-traumatic hydrocephalus (PTH)

Hypertension

Dysautonomia

Post-traumatic seizures

Deep venous thrombosis (DVT)

Malnutrition

Bowel related issues

Pressure ulcers

Endocrine dysfunction

Heterotopic ossification (HO)

Pathological laughter/crying

Depression and post-traumatic stress disorder (PTSD)

Urological dysfunction

Spasticity



## Somatic

Headaches  
Balance Problems  
Sleep Problems  
Dizziness  
Noise Sensitivity  
Light Sensitivity  
Fatigue  
Tinnitus  
Nausea  
Impaired Taste  
Impaired Smell

## Neurocognitive

Attention/concentration  
Language  
Awareness  
Learning and Memory  
Visuospatial skills  
Executive skills  
Vision Changes  
Aspontaneity  
Loss of Drive or Initiative  
Inappropriate Social Responses

## Psychological

Mood changes  
Irritability  
Anxiety  
Depression  
Emotional Lability  
Apathy  
Personality changes  
Impulsivity  
Agitation  
Belligerence and Anger  
Paranoia  
Hallucination  
Restlessness  
Substance Use

# Long Term Effects of TBI

Decline in academic/professional performance

Loss of employment

Loss of driving

Decreased sense of independence and/or self worth

Major social, societal & family consequences

Life-changing

Misunderstood and under-diagnosed



## Predictors of Brain Injury Recovery

Duration of Time in the Post-traumatic Amnesia State (PTA) is One of the Strongest Predictors of Outcome After TBI

- Faster emergence from PTA = better prognosis

The Galveston Orientation and Amnesia Test (GOAT) is used to assess emergence from PTA

Alternative: Orientation Log (O-LOG)

Injury Severity at Time of Initial Injury is Informative but Not a Reliable Measure of Prognosis

There is a shift toward a more comprehensive assessment to classify brain injury severity as opposed to GCS, LOC, and PTA alone

## Other Predictors of Brain Injury Recovery

### **Age**

#### **PMHX/PSHX**

Premorbid conditions  
MH history  
h/o prior brain injuries  
Socio Environmental factors  
Social support  
Premorbid functional level

#### **Type of Damage**

Focal vs. Diffuse;

#### **Etiology**

Traumatic vs. Atraumatic;  
Hemorrhagic vs. Ischemic/Anoxic

### **Imaging findings (CT, MRI)**

### **Severity of Damage**

### **Disorder of**

### **Consciousness**

### **Time since injury**

### **Pupillary light reflex**

### **Doll's eye sign**

### **Caloric testing**

### **SSEP**

### **Rate of Recovery**



## Recovery from Concussion

In the general population, about 60% of people suffering from a concussion are better in 2-4 weeks.

Persistent post-concussive symptoms refers to symptoms >14 days in adults and >4 weeks in children.

About 80 to 90% of people are better in 2 to 3 months.

About 10 to 20% of people have symptoms which linger.



## Recovery from Mild TBI

Approximately 50% of patients with mild TBI do not attain full recovery by 12 months.

### **The strongest predictors of persistent symptoms are:**

Cognitive symptoms (difficulty concentrating) - 3× increased odds

Pre-existing mental health conditions (anxiety, depression, sleep disorders)

Female sex

History of migraine

Previous psychiatric history

Assault-related injury

Previous head injury



## Recovery from Moderate-Severe TBI

Most improvement occurs within the first weeks to months

Neurocognitive and functional improvement may continue for years, with more individuals improving than declining during first 5 years post-injury

Long-term recovery often incomplete among individuals with more severe injuries



# Recovery from Anoxic Brain Injury

## Prolonged Disorders of Consciousness (>28 days post-injury):

Among patients with severe anoxic brain injury and prolonged disorders of consciousness:

26% mortality rate

26% show clinical improvement

17% recover full consciousness

- **Predictors of better outcomes:**

Younger age

Baseline diagnosis of minimally conscious state (vs unresponsive wakefulness state)

Higher Coma Recovery Scale scores

Earlier admission to intensive rehabilitation

Recovery possible even with malignant SEP results

## Recovery from Anoxic Brain Injury

### Cognitive Outcomes in Anoxic Injury Survivors:

Most cognitive recovery occurs in first 3 months, with minor improvements up to 12 months  
30-50% have persistent cognitive impairment in chronic stage  
Predominant deficits: verbal memory, learning ability, executive function, decreased processing speed, attention

### Long-term Survival and Neurologic Recovery:

most functional recovery occurs within 6 months, BUT...  
considerable variability exists... some experience clinically meaningful improvements in both functional and cognitive outcomes up to 2 years post-arrest  
need for ongoing monitoring and rehabilitation.



## Comparison: Anoxic vs Traumatic Brain Injury

Relative to TBI patients, those with anoxic brain injury:

Are referred later for rehabilitation

Make slower progress with poorer outcomes

Are more likely to require residential care

Have more severe cognitive impairments, particularly in visual memory and short-term memory



# Rehabilitation Team



**Physiatrist**

**Rehab Nursing Staff**

**Neuropsychologist**

**Social Worker**

**Care Manager**

**Counselors**

**Spiritual Care**

**Patient/Client**

**Family**

**Physical Therapist**

**Occupational Therapist**

**Speech Language**

**Pathologist**

**Recreational Therapist**

**Vocational Therapist**



# Rehabilitation

## Vestibular PT

- Gait and balance problems, dizziness
- Headache management

## Occupational Therapy

- Vision
- IADL/community activities
- Cognition

## Neuropsychology

- Comprehensive neurocog and psych testing
- Support/therapy
- Behavioral modifications
- Reasonable accommodations

## Speech/Swallow Therapy

- Aphasia
- Dysarthria
- Dysphagia
- Cognition

## Vocational Rehab

- Work/school

# CASE DISCUSSION



# CASE DISCUSSION

- 36 year old male with polysubstance abuse history, found down with difficulty breathing, EMS called.
- Brain MRI consistent with diffuse injury.
- S/p placement/insertion of tracheostomy and gastrostomy tubes.



# REFERENCES

- American Academy of Physical Medicine and Rehabilitation. (2018). BIAA non-lethal opioid overdose and acquired brain injury position statement [Endorsed by AAPM&R]. <https://www.aapmr.org>
- Caine, D., & Watson, J. D. (2000). Neuropsychological and neuropathological sequelae of cerebral anoxia: A critical review. *Journal of the International Neuropsychological Society*, 6(1), 86-99.
- Centers for Disease Control and Prevention. (2007). Nonfatal traumatic brain injuries from sports and recreation activities—United States, 2001–2005. *Morbidity and Mortality Weekly Report*, 56(29), 733-737. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5608a7.htm>
- Corrigan, J. D., & Bogner, J. (2007). Initial reliability and validity of the Ohio State University TBI Identification Method. *The Journal of Head Trauma Rehabilitation*, 22(6), 318-329. <https://doi.org/10.1097/01.HTR.0000300227.67748.77>
- Cronberg, T., Greer, D. M., Lilja, G., Moulaert, V., Swindell, P., & Rossetti, A. O. (2020). Brain injury after cardiac arrest: From prognostication of comatose patients to rehabilitation. *The Lancet Neurology*, 19(7), 611-622.
- Dams-O'Connor, K., Cantor, J. B., Brown, M., Dijkers, M. P., Spielman, L. A., & Gordon, W. A. (2014). Screening for traumatic brain injury: Findings and public health implications. *The Journal of Head Trauma Rehabilitation*, 29(6), 479-489. <https://doi.org/10.1097/HTR.0000000000000099>
- Elovic, E., Baerga, E., Cuccurullo, S. J., Greiss, C., Thomas, A., Levine, J., & Malone, R. J. (2020). Traumatic brain injury. In S. J. Cuccurullo (Ed.), *Physical medicine and rehabilitation board review* (4th ed., pp. 55-100). Demos Medical.
- Giacino, J. T., Ashwal, S., Childs, N., Cranford, R., Jennett, B., Katz, D. I., Kelly, J. P., Rosenberg, J. H., Whyte, J., Zafonte, R. D., & Zasler, N. D. (2002). The minimally conscious state. *Neurology*, 58(3), 349-353. <https://doi.org/10.1212/wnl.58.3.349>
- Hoffer, M. E., Szczupak, M., Kiderman, A., Crawford, J., Murphy, S., & Marshall, K. (2016). Neurosensory symptom complexes after acute mild traumatic brain injury. *PLoS One*, 11(1), e0146039.
- Levin, H. S., & Diaz-Arrastia, R. R. (2015). Diagnosis, prognosis, and clinical management of mild traumatic brain injury. *The Lancet Neurology*, 14(5), 506-517.
- McLaren, J., Fradera, A., & Cullen, B. (2025). The reliability and validity of brief cognitive screening tools used in traumatic brain injury: A systematic review. *Neuropsychological Rehabilitation*, 35(1), 1-25.
- Menon, D. K., Silverberg, N. D., Ferguson, A. R., Temkin, N., Stein, M. B., Whyte, J., Jain, S., Manley, G. T., & Yue, J. K. (2025). Clinical assessment on days 1-14 for the characterization of traumatic brain injury: Recommendations from the 2024 NINDS Traumatic Brain Injury Classification and Nomenclature Initiative Clinical/Symptoms Working Group. *Journal of Neurotrauma*, 42(1-2), 1-18.
- Orr, T. J., Lesha, E., Kramer, A. H., Gallagher, C. N., & Hawryluk, G. W. J. (2024). Traumatic brain injury: A comprehensive review of biomechanics and molecular pathophysiology. *World Neurosurgery*, 181, 52-68.
- Perkins, G. D., Callaway, C. W., Haywood, K., Neumar, R. W., Lilja, G., Rowland, M. J., Sawyer, K. N., Skrifvars, M. B., & Nolan, J. P. (2021). Brain injury after cardiac arrest. *The Lancet*, 398(10307), 1269-1278.
- Peskine, A., Rosso, C., Picq, C., Caron, E., & Pradat-Diehl, P. (2010). Neurological sequelae after cerebral anoxia. *Brain Injury*, 24(5), 755-761.
- Stocchetti, N., Carbonara, M., Citerio, G., Ercole, A., Skrifvars, M. B., Smielewski, P., Zoerle, T., & Menon, D. K. (2017). Severe traumatic brain injury: Targeted management in the intensive care unit. *The Lancet Neurology*, 16(6), 452-464.
- Theadom, A., Hardaker, N., Bray, C., Hume, P., Starkey, N., Barker-Collo, S., & Feigin, V. L. (2021). The Brain Injury Screening Tool (BIST): Tool development, factor structure and validity. *PLoS One*, 16(3), e0247722.



# RESOURCES

[NYS DOH Traumatic Brain Injury](#)

[Behavioral Health Guide: Considerations for Best Practices for Children, Youth, and Adults with TBI](#)

[The Brain Injury Association of New York State](#)

[TBI Medicaid Waiver Program](#)

[Brainline](#)

[Take Charge of Your Brain Health!](#)

[Model Systems Knowledge Translation Center](#)

[Living with TBI: A Roadmap for Individuals with Traumatic Brain Injury](#)



# Next Session

## Brain Injury Treatment: Psychopharmacology and Medical Interventions

- **April 21, 2026 10AM**
- Presenters: Dr. Brian Im and Dr. Jessica Rivetz

Register here: <https://meetny.gov/webex.com/webex/register/r31b4bcb661faa00cf27024fc074f318>





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