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Traumatic Brain Injury and Opioid Overdose: An Unrecognized Relationship

Brain Injury Association of America Webinar

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Summary

- Substance abuse is a risk factor for TBI.
- 51.5% of people with TBI will have chronic pain.
- 70% of people with TBI are prescribed an opioid.
- People with TBI are 11 times greater risk for opioid misuse and accidental overdose.
- New Recommendations for Prescribing Opioids for People with TBI
- New Toolkit for Providers and Survivors/Families on TBI and Opioids

Narcotics Prescription During Inpatient TBI Rehabilitation – TBIMS Data

received in sample 2103;
% received among the other agents

Oxycodone (864; 37%)
acetaminophen (APAP) + hydrocodone (688; 30%)
morphine (205; 9%)
fentanyl (145; 6%)
tramadol (142; 6%)
hydromorphone (85; 4%)
propoxyphene N + APAP (84; 4%)
codeine (48; 2%)
methadone (44; 2%)
APAP + codeine (14; <1%)
meperidine (4; <1%)
buprenorphine (4; <1%)
propoxyphene N (4; <1%)

- 10 sites; n = 2,103
- 72% sample received narcotics:
Highest frequency of meds studied
- 55% 1st 2 days:
- 45% Last 2 days:
- % in sample received:
 - 26% scheduled
 - 63% PRN

Hammond FM, Barrett RS, Shea T, Seel RT, McAlister TW, Kaelin D, Horn SD.
Psychotropic medication use during inpatient rehabilitation for traumatic brain injury.
Arch Phys Med Rehabil 2015; **96**(8): S256-73.



Deaths Due to Accidental Poisonings following TBI

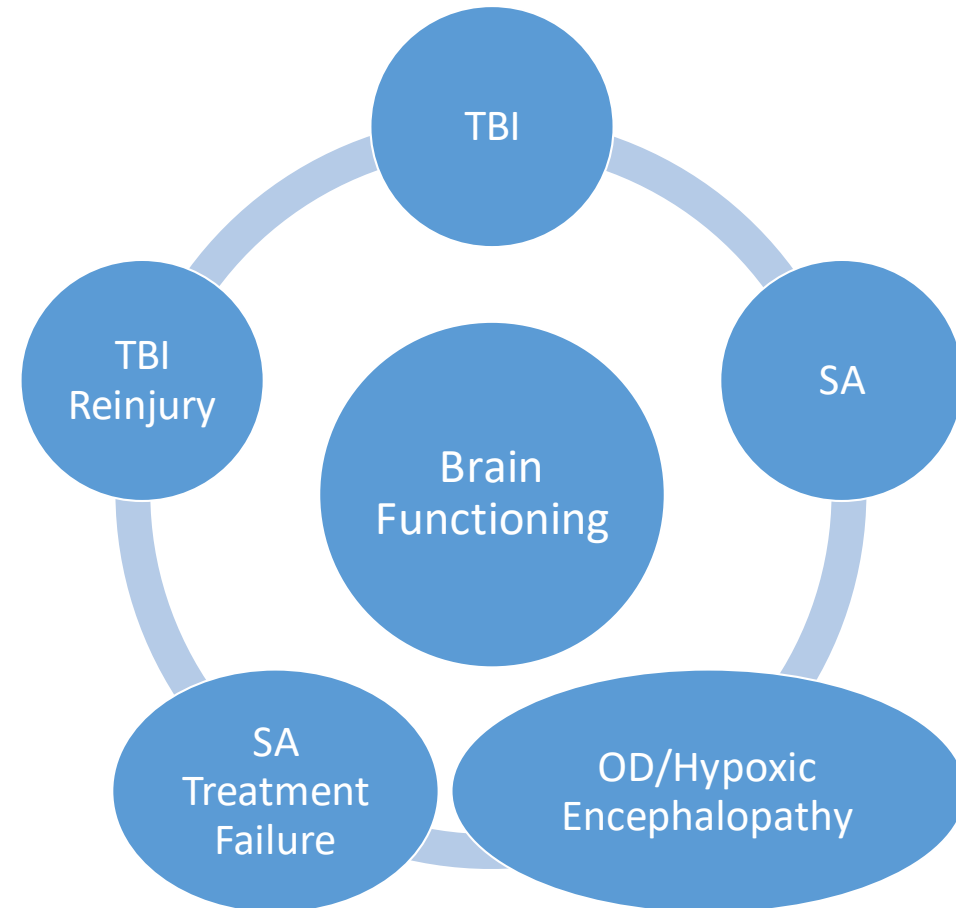
| ACCIDENTAL POISONING BY: | n |
|---|-----------|
| Unspecified drug | 14 |
| *Opiates and related narcotics | 13 |
| *Analgesics antipyretics and antirheumatics | 11 |
| *Methadone | 6 |
| Psychostimulants | 7 |
| Alcohol + | 6 |
| *Other specified analgesics and antipyretics | 2 |
| Local anesthetics | 2 |
| *Aromatic analgesics, not elsewhere classified | 1 |
| Other specified sedatives and hypnotics | 1 |
| Agents affecting blood constituents | 1 |
| Agents acting on muscles & respiratory system | 1 |
| Other specified drugs | 1 |
| Other specified gases and vapors | 1 |

- n = 14,398
- 1,519 died (11%)
- 4.4% (67) AP deaths
- AP death 11x more likely than general population

Hammond FM, Ketchum JM, Dams-O'Connor K, Corrigan JD, Miller AC, Haarbauer-Krupa J, Faul M, Trexler L, Harrison-Felix C. Mortality secondary to unintentional poisoning after inpatient rehabilitation for traumatic brain injury. In preparation.

Why are people with TBI 11 times more likely to overdose?

- Substance Abuse is a Risk for TBI
- TBI is a Risk for Substance Abuse and Overdose
- Both are Risk for Involvement in the Juvenile/Criminal Justice Systems
- TBI is a Risk for TBI



Substance Abuse as a Risk Factor for TBI

- 37-66% have history of alcohol misuse
- 35-50% of TBI's were found to be use related.
- 71% of TBI secondary to assault were use related.

Corrigan JD, Rust E & Lamb-Hart GL (1995). The nature and extent of substance abuse problems in persons with traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 10(3), 29-46.

Parry-Jones B, Vaughn FL & Cox M (2006). Traumatic brain injury and substance misuse: A systematic review of prevalence and outcome research (1994-2004). *Neuropsychological Rehabilitation*, 16(5), 537-560.

Ponsford, J, Whelan-Goodinson R & Bahar-Fuchs, A (2009). Alcohol and drug use following traumatic brain injury: A prospective study, *Brain Injury*, 21(13-14), 1385-1392.

TBI as a Risk Factor for Substance Abuse

- Population of study of 6383 9th-12th graders who had LOC 5 minutes or greater or 1-night hospital stay were found to
 - 2 times greater risk for binge drinking
 - 2.5 times greater risk for daily cigarette smoking
 - 2.9 times greater risk for nonmedical use of prescription drugs
 - 2.7 times greater risk for using illegal drugs

TBI as a Risk Factor for Both Juvenile Justice and Mental Health

- 508 psychiatric inpatient adolescents
- Adolescents with TBI had significantly more often committed crimes (53.8%) compared to adolescents without TBI (14.7%)
- Subjects with TBI had significantly more violent crimes
- TBI during childhood and adolescence increased the risk of:
 - any criminality 6.8-fold (95% 3.0–15.2),
 - conduct disorder 5.7-fold (95% 2.1–15.4). and
 - concomitant criminality and conduct disorder 18.7-fold (95% 4.3–80.1)

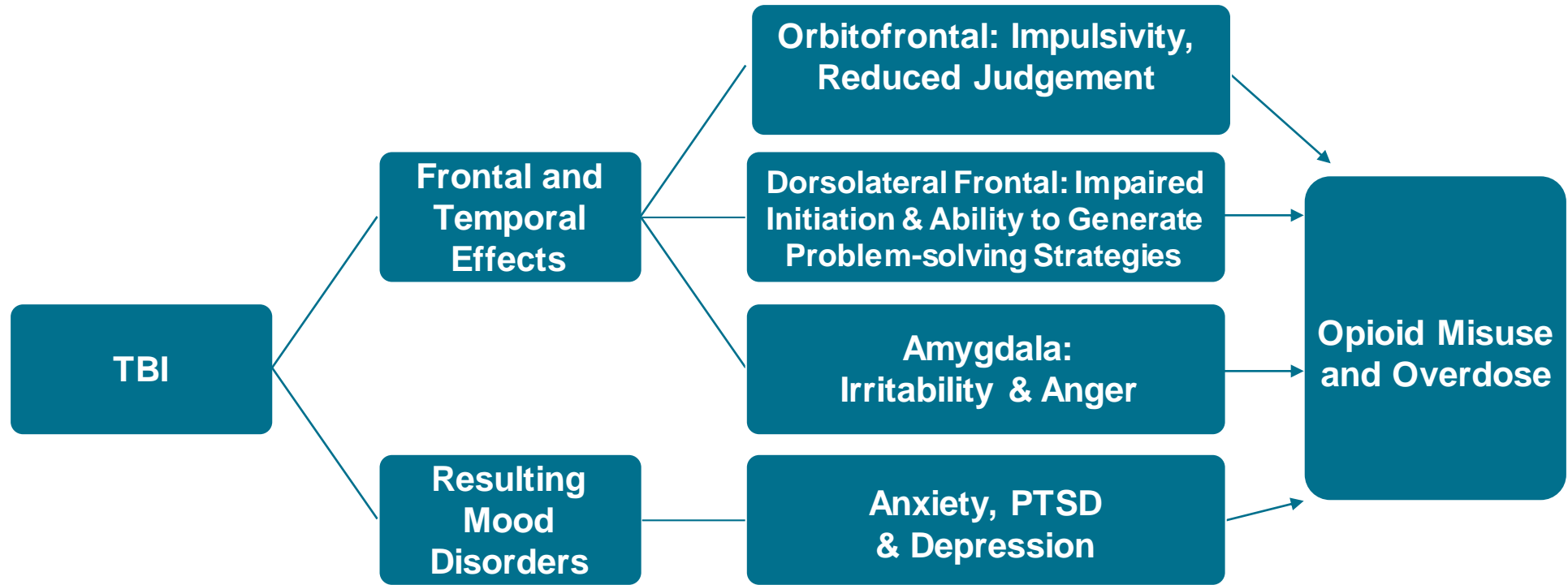
Relationship of TBI to Pre- and Post-TBI Alcohol Abuse

- Those with TBI consumed significantly more than national averages pre-injury, but after injury, use was consistent with national averages after one year, but increased again by two years post-injury.
- Approximately **20%** who either abstained or were “light” drinkers pre-TBI showed high use post-injury.
- Substance misuse followed by a more severe TBI will increase vulnerability to addiction above and beyond risk associated with prior use

Corrigan JD, Bogner J, Holloman C. Lifetime history of traumatic brain injury among persons with substance use disorders. *Brain Inj* 2012; **26**(2): 139-150.

McKinlay A, Corrigan J, Horwood LF, Fergusson DM. Substance abuse and criminal activities following traumatic brain injury in childhood, adolescence, and early adulthood. *J Head Trauma Rehabil* 2014; **29**(6): 498-506.

Neuropsychology of Opioid Misuse following TBI



TBI and Types of Pain

Of TBI patients admitted to an acute rehabilitation unit:

- 40-50% reported headache at 3, 6 and 12 months post-injury.
- 12% developed complex regional pain syndrome.
- 11% developed painful heterotopic ossification.
- 10% were found to have peripheral neuropathic pain.
- 51.5% .of people with TBI will have chronic pain.

Hoffman, J.M, Lucas,S., Dikmen, S., Braden, C.A., Brown, A.W., Brunner, R.,...Bell, K.R. Natural history off headache following traumatic brain injury. *J Neurotrauma* 2011; 28(9): 1719-1725.

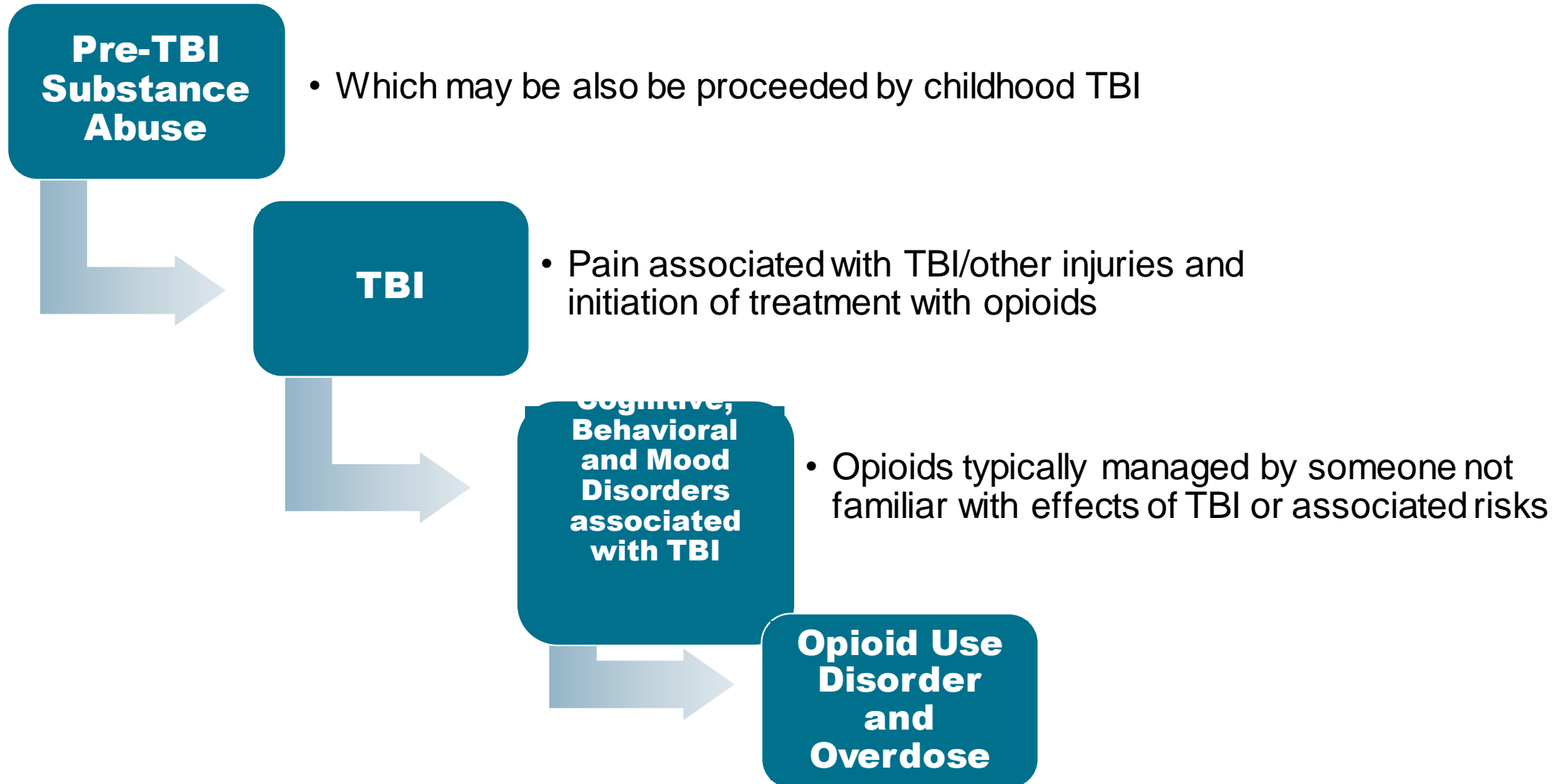
Nampi aparampil, DE. Prevalence of chronic pain after traumatic brain injury: A systematic review. *JAMA* 2008; 300(6): 711-719.

Substance Abuse Treatment and TBI

- Providers often don't know that the client has brain injury and related impairments
- Patients with brain injury take 2-3 times more treatment
- Patients, providers and the juvenile justice/criminal justice systems don't know why they are failing treatment
- Providers don't know what brain injury resources might be available or how to accommodate for the effects of the brain injury



Clinical Evolution of TBI and Opioid Overdose



RECOMMENDATIONS FOR PRESCRIBING OPIOIDS FOR PEOPLE WITH TRAUMATIC BRAIN INJURY

Archives of Physical Medicine and Rehabilitation, in Press

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Prescribing Recommendations in the Acute (< 12 weeks) Setting

- TBI Pain Assessment in context of cognitive-communication impairments may require alternative means of assessment
- Critical to determine personal and/or family history of SUD
- Nociceptive versus neuropathic, and treat accordingly
- Strongly recommend a multidisciplinary, multimodal approach maximizing nonpharmacological and nonopioid therapy
- Check Prescription Drug Monitoring Program for previous opioid prescriptions

Prescribing Recommendations in the Acute (< 12 weeks) Setting

- Avoid starting opioids if possible
- If not, use short-term (7 or less days) for tolerance of therapies with plan discontinuance
- Use immediate release opioids and avoid long-acting opioids
- Start with the lowest effective dose
- Opioids may increase acute TBI post-traumatic delirium and/or lethargy— ongoing assessment
- If pain unresolved at 6 weeks, reassess

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- Chronic pain management should be multidisciplinary and multimodal, including maximizing nonpharmacologic and nonopioid therapies
- If opioids have to be continued, measurable goals should be agreed upon, such as improvement in function, and a clear plan for discontinuation
- Pain agreements should be mandatory before starting and periodically during opioid therapy, where clinicians should discuss with patients known risks and realistic benefits of opioid therapy and patient and clinician responsibilities for managing therapy

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- Screen for Lifetime Exposure to TBI
 - Ohio State University-TBI-Identification Method
 - <https://wexnermedical.osu.edu/neurological-institute/departments-and-centers/research-centers/ohio-valley-center-for-brain-injury-prevention-and-rehabilitation/osu-tbi-id>
 - Standardized and validated structured interview
 - 3-5 minutes to administer
 - Classification for none or possible mild, moderate or severe TBI
 - TBI is cumulative, hence lifetime exposure
 - Multiple mild TBI's might result in moderate or severe impairment (domestic violence, sports)
 - Childhood exposure vs adult
 - Temporal proximity of multiple TBI's very important

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- Consider Impact of Cognitive and Neurobehavioral Impairments
 - Does the patient remember:
 - dosage and frequency? Changes in dosage and frequency?
 - Discussion about opioids use in physician visit?
 - That they might have already taken their medication?
 - Their pain levels in response to treatment?
 - Can the patient:
 - Self-regulate use of opioids?
 - Use behavioral-cognitive strategies?
 - Align behavior with stated goals?

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- To Accommodate the Effects of Cognitive and Behavioral TBI Impairments, Consider
 - Provide written instructions to patient and family
 - Use checklists for
 - When they have taken medication
 - Its effectiveness
 - Any side-effects
 - Use controlled medication dispenser or have family control medications (less desirable)
 - Have a family member at appointments

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- Incorporate Knowledge of Previous SUD into Decision-making
 - Lifetime history of TBI
 - Lifetime history of SUD and age
 - Response to SUD treatment
 - Family and friend history of SUD
 - Severity of TBI
 - Severity of Cognitive and Neurobehavioral Impairment

Prescribing Recommendations in Chronic TBI (> 12 weeks)

- When an Opioid is Prescribed:
 - Have a follow-up plan that includes:
 - More frequent follow-up
 - Consider having family present
 - Using necessary TBI accommodations
 - Monitor for cognitive or behavioral decline (O-Log/C-Log; Mini-Mental State Examination)
 - Communicate the effects of the TBI to treatment team
 - Make Accommodations for Effects of TBI (detailed listing of TBI accommodations can be found at <http://www.ohiovalley.org/informationeducation/accommodatingtbi/>)



- Ohio Valley Center for Brain Injury Prevention and Rehabilitation
- Accommodating the Symptoms of TBI
 - Symptoms
 - What to look for
 - How to manage or accommodate for them
 - <http://ohiovalley.org/informationeducation/accommodatingtbi/index.cfm>

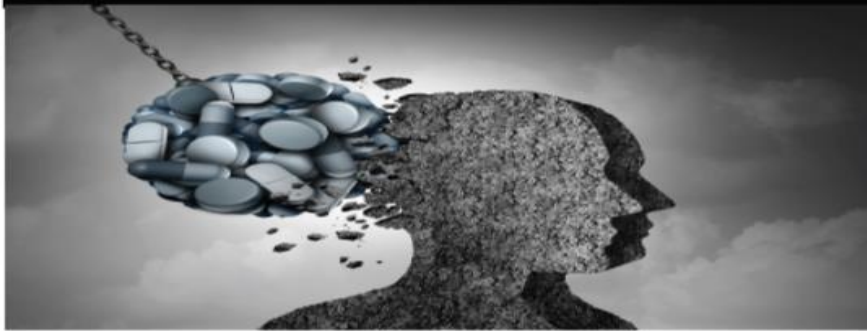
New Resources: TBI-Opioids Webinar

- Structure:
 - Digitally-recorded
 - Open access from web
 - 2 hours
 - Free CME's
- Contents:
 - What is a TBI? - Flora Hammond, MD
 - Screening for Lifetime Exposure to TBI - John Corrigan, PhD
 - TBI as a Risk Factor for Opioid Misuse and Overdose. Lance Trexler, PhD
 - Recommendations for Prescribing Opioids for those with Lifetime History of TBI - Shashank Davè, MD
 - Where to find TBI Resources and Supports - Wendy Waldman, BSW

Pick a time that best fits **your** time schedule.

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WEBINAR INVITATION



OPIOIDS & TBI: An Unrecognized Relationship

An introduction to Traumatic Brain Injury (TBI)-specific issues related to prescribing opioids and opioid misuse.

WHY IS THIS WEBINAR IMPORTANT:

Because of the consequences of traumatic brain injury (TBI), **people with TBI are at a significantly greater risk for opioid addiction and overdose as compared to those without TBI.** More than 60% of patients with TBI are discharged on an opioid. Based on analyses of 14,398 subjects in the Traumatic Brain Injury Model Systems, it was found that **people with TBI were 11 times more likely to die of overdose than the non-brain injured population.** Last, most prescribers are not aware that they are prescribing opioids for an individual with TBI. **We have in Indiana approximately 122,000 citizens living with chronic disability from TBI who are at high risk for opioid misuse/overdose.**

INTENDED AUDIENCE: (by general professional designation): Physicians, Pharmacists, Pharmacy Techs, Nurses, Physician Assistants, Social Workers, Behavioral health treatment providers, Therapists, Counselors, Medical Professionals, Psychologists, Addiction Specialists, Case Managers, Peer Specialists and others in the field of brain injury.

In this **2-hour webinar**, TBI researchers and expert practitioners provide practical recommendations intended to reduce the rate of opioid misuse and overdose for a particularly high-risk group of people with TBI.

Part I

- What is a TBI?
- How to Screen for TBI

Part II

- Increased Risk for Opioid Misuse following TBI
- Review of Recommendations
- Where to Find Brain Injury Resources & Supports

HOW TO ACCESS: Online, this on-demand webinar can be accessed through INTrain. **Create an Account** at www.train.org/indiana. **Register for the course** by selecting **Training Plan ID: 4122** or by searching for the title of the webinar: **"Opioids & TBI: An Unrecognized Relationship."**

Details on how to create an INTrain account and access the webinar can be found on the backside of this flyer. For more information about this webinar, contact Judy Reuter for assistance at Judy.Reuter@RHIN.com

TBI-Opioids Toolkit Content Examples

- Awareness Infographic (in preparation)
- Overview of Toolkit:
 - Why TBI and Opioids
 - Overview of the Toolkit for Patient/Family and Providers and How to Use it
- Overview of the Problem/Risk
 - Epidemiology of TBI
 - Severity of TBI: concussion-severe TBI
 - Substance and TBI (pre and post)
 - Pain and TBI
 - Clinical Course of TBI and Opioid Misuse
- Strategies for Opioid Avoidance in the Acute and Chronic Setting

TBI-Opioids Toolkit Examples

- How to Screen for Lifetime Exposure to TBI
- How to make basic accommodations for TBI
- Hypoxic Encephalopathy associated with Overdose Recovery
- Alternative Pain Control Strategies
- Prescribers risk factors checklist
- Patient self-monitoring checklists
- What to do when risk increases

<https://www.in.gov/isdh/28599.htm>

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