TBI in Juvenile Justice: Data and Directions

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Learning Objectives

- 1. Participants will gain an understanding of a model being implemented in Colorado to identify and support individuals with brain injury.
- 2. Participants will learn about the 7-year outcomes from this project and plans for sustainability.
- 3. Participants will be able to list the prevalence of brain injury in the adult and juvenile justice system.

Disclosure

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

Pennsylvania

- 529,200 Pennsylvanians are living with Acquired Brain Injury
- 98,000 new traumatic brain injuries each year
- 86,240 Emergency Room visits for brain injury per year
- 18,788 hospitalizations from brain injury (TBI)
- 2,078 die from a brain injury each year
- https://biapa.org

TBI Complications



25% - 97% in criminal justice 60% substance abuse





48% homeless 60% mental illness



Mental Health Fallout

- Almost half of adults with TBI who have no pre-injury history of mental health problems develop mental health problems within 1 year of the TBI
 - 18–61% depression, 1–22% mania, 3–59% posttraumatic stress disorder, 20–40% post-traumatic aggression, 8% panic disorder, 8% specific phobia, and 6% psychotic disorders
 - (Kim et al., 2007)
- 85% of survivor families report that emotional or behavioral problems have an impact on their function
- Suicidal ideation is 7x higher in people with TBI than in those without
 - Increased suicide risk persists up to 15 years post-injury
 - (Fazel, et al., 2014)

Mortality Risk

- Reduced life expectancy (~ 7 years)
 - (Harrison-Felix et al., 2004; Harrison-Felix et al., 2009)
- Compared to non-injured general population matched for age, race, and gender
 - -49x more likely to die of aspiration pneumonia
 - -22x more likely to die of seizures
 - -3x more likely to die of suicide
 - National Suicide Prevention Lifeline 800-273-TALK (8255)
- 7x increased risk of death within 15 months of discharge
 - (Selassie et al., 2005)

Health Risks

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

Other Neurobiological Changes

- Blood Brain Barrier (BBB) dysfunction
 - Immediate disruption due mechanical damage
 - Chronical disruption due to inflammation
- Abnormal neuro-inflammatory processes
 - After repeated impacts=increased proinflammatory and decreased anti-inflammatory cytokine levels

See also: Hunter, Branch, & Lipton. (2019). The neurobiological effects of repetitive head impacts in collision sports. Neurobiology of Disease, 123, 122-126.

Special Risks for Girls & Women

- Research on HS, NCAA, combat and professional contact sports=disproportionate focus on men
- More postconcussive symptoms and higher rate of long-term disability
 - (Bazarian, Blyth, Mooerjee, He, & McDermott, 2010; Corrigan et al., 2010)
- More mood problems, particularly depression and suicidality
 - (Perna, 2005; Wasserman, Shaw, Vu, Ko, Bollegala, & Bhalerao, 2008)
- They use more AND less community health services than women without TBI
 - (Toor et al., 2016)
- 50% women with TBI reported not receiving needed care, particularly for mental health symptoms
 - More structural and financial barriers than women without TBI
 - (Toor et al., 2016)

Why Screen for TBI Among Justice-Involved Individuals?

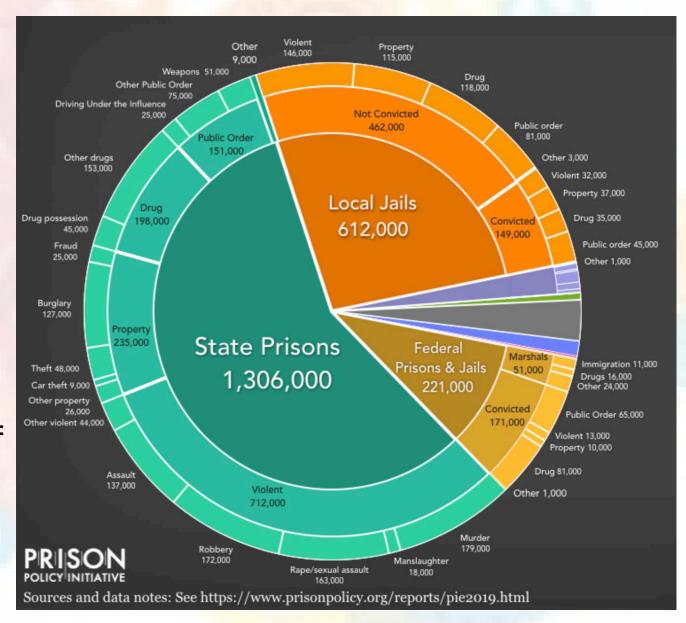
Federal Recommendations

- The *Commission on Safety and Abuse in America's Prisons* was established in 2005 to identify and recommend solutions to the most serious challenges facing America's jails and prisons.
- 2006 report (http://www.ojp.usdoj.gov/bjs/mhppji.htm and http://wera.org/project/commission-safety-and-abuse-americas-prisons) recommend increased health screening, evaluation, and treatment for inmates as well as
 - Routine screening for TBI
 - Screening individuals with TBI for substance abuse and co-occurring mental health diagnoses
 - Education for personnel about how to manage and support individuals with TBI

Incidence and Prevalence of Brain Injury in Criminal Justice Settings

U.S. Data

- 2003, 2010, 2014, 2016, 2019
 - 50% of young males, 49% of young females in youth corrections
 - 65% of males and 73% females in County Jails
 - 87% justice-involved adults report TBI over their lifetime
 - 36% reported TBI in the prior year
- 7+ million people under supervision(2.3M incarcerated)= 4.55 million people living with brain injury in the system



Global Problem

- Canada 2016
 - Men and women with a history of TBI were 1.5 times more likely to have a corrective services record
- France 2017
 - 31% of inmates report brain injury history
- UK 2014
 - 32% of young men reported more than 1 TBI with a loss of consciousness

Risk for TBI DURING Incarceration

- NYC jail 10,925 individuals (average daily census)
 - Electronic health record (EHR) was modified in June 2012 to include blows to the head, loss of consciousness, and being "dazed or confused."
 - TBI rate is 50x higher than ER and trauma centers
 - Siegler, A., Rosner, Z., MacDonald, R., Ford, E., & Venters, H. (2017). Head Trauma in Jail and Implications for Chronic Traumatic Encephalopathy in the United States: Case Report and Results of Injury Surveillance in NYC Jails. Journal of Health Care for the Poor and Underserved, 28(3), 1042-1049



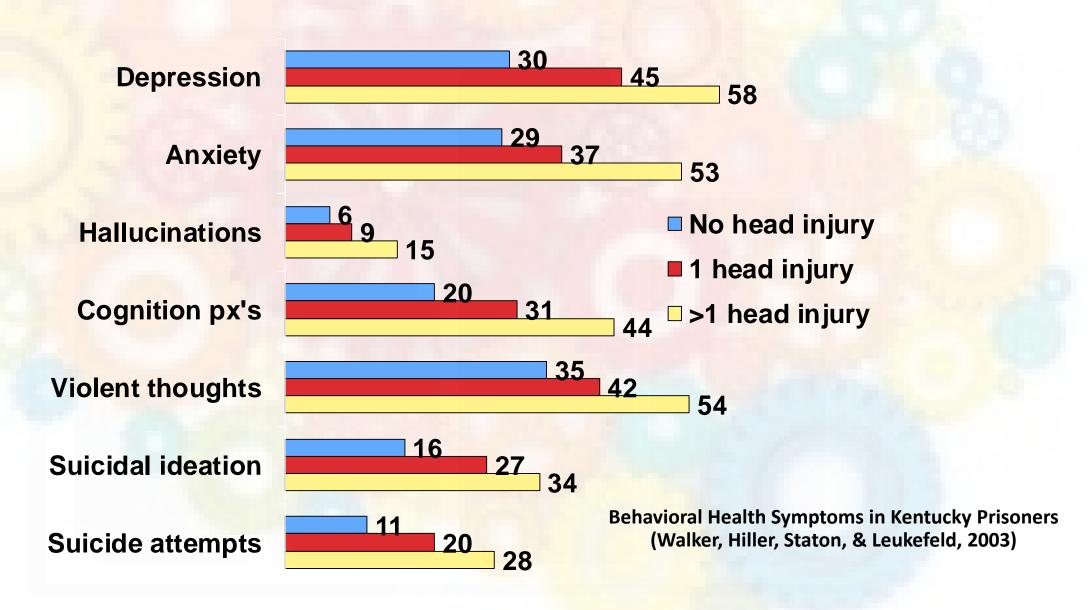
Correctional Health Services and Offender Management

- Increased utilization of services while incarcerated (health and psychological)
- Lower treatment completion rates and higher rates of disciplinary incidents
- Lower ability to maintain rule-abiding behavior during incarceration
- More prior incarcerations
- Higher rates of recidivism (Piccolino & Solberg, 2014)
- Criminal behavior can increases after TBI (especially severe TBI)
 - Farrer & Hedges, 2011; Brooks et al., 1986; Fazel et al., 2011; McIsaac et al., 2016; Timonen et al., 2002; Elbogen et al., 2015

Greater distress during incarceration

- Severe depression and anxiety
- Substance use disorders
- Problematic anger
- Suicidal ideation and/or attempts

Correlates of Injury



Treatment

- Treat the Deficit not the BRAIN INJURY
- Persons may be eligible for other support services
 - e.g., BIAPA www.biapa.org
 - BIAPA's Brain Injury Resource Line (BIRL) 1-800-444-6443
- Activities can be adapted for neurocognitive deficits.
 - Minimize environmental distractions.
 - Written material/handouts where possible
 - Repetition of key points
 - Non-electronic devices might include checklists, pictures or icons, photograph cues, post-it-notes, calendars, planners, and journals.

COLORADO PROJECT: Screening, Identification, Referral, and Support



MINDSOURCE BRAIN INJURY NETWORK





















Screening for Lifetime History of TBI

Ohio State University Traumatic Brain Injury Identification method modified (OSU-TBI-ID; Corrigan & Bogner, 2007)—See handout

- Sites administer OSU TBI-ID (3-5 minutes)
- Determined positive if meet one or more of the following criteria:
 - * Worst: moderate/severe brain injury
 - * First: injury with loss of consciousness before age 15
 - * Multiple: 3 or more injuries with altered mental status or
 - 2 injuries within a 3 month period

Overview

- Colorado Brain Injury Program
 - US Health and Human Services, Administration for Community Living (ACL) funding
 - 4-year project (now in year 7)
- 20+ partner sites
 - Denver County Jail Transition Unit; Denver County Jail RISE Unit; Boulder County Jail; Larimer County Jail; Adams County Veteran's Court, Sex Offender, and Female Offender Populations; Denver Drug Court; Denver Juvenile Probation, Jefferson County Recovery and Veteran Courts; Arapahoe Persistent Mental Health Population; and six state operated Division of Youth Corrections sites

AIMS

- 1) Screening for brain injury and impairment
- 2) Referral for case management support
- 3) Education and capacity-building

Screen for Lifetime History of TBI

- Ohio State University Traumatic Brain Injury Identification Method (OSU-TBI-ID; Corrigan & Bogner, 2007)
 - http://www.ohiovalley.org/tbi-id-method/
- Positive if responses meet one or more of the following criteria:

* Worst: moderate/severe brain injury

* First: injury with loss of consciousness before age 15

* Multiple: 3 or more injuries with altered mental status or

2 injuries within a 3 month period

NOTE: 42% of person(s who indicated they had incurred a TBI as defined by the CDC did not answer YES on single question screen

Step 1 Ask questions 1-5 below.	Step 2 For each reporte			cO)— I	Step		tions to identi	ify a history
Record the cause of each reported injury to the right of this box in "Step 1 Continued"	Record answers (Additional space	n Step 2 Conti	nued below		of multip Record a		3	
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	Where you knocked out or (LOC)? • If yes, how long? • Were you dazed or or	ple,	Have you ever had a period of time in which you experienced multi- ple, repeated impacts to your head (e.g. history of abuse, contact sports, military duty)?					
an emergency room following an injury to your head or neck? Think about any childhood injuries you remember or were told about.	memory from the inj How old were you?		 If yes, what was the typical or usual effect – where you knocked out (Loss of Consciousness – LOC)? If no, were you dazed or did you have a gap in your memory 					
☐ No ☐ Yes—Record cause in chart to right 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?	Record answers in Step 2 Continued below				from the injury? What was the most severe effect from one of the times you have impact to the head? How old were you when these injuries began? Ended?			
☐ No ☐ Yes—Record cause in chart to right		1			W old Wele you wi	ien these injunes	begain ended:	
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?	Step 1 Continued Cause	Step 2 Loss No LOC	s of consciousnes	ss (LOC)/knock 30 min-24 hrs.		Dazed/N Yes	Лет Gap No	Age
☐ No ☐ Yes—Record cause in chart to right								
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 to right								
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	How many injuries total h	ave you had in	your lifetime?	,				
☐ No ☐ Yes—Record cause in chart to right	Step 3	Typical E	ffect		Most Severe E	ffect		Age
Interviewer instruction: If the individual has been exposed to repeated injuries such as through DV or football etc. those incidences should be	Cause of repeated injury	Dazed/ memory gap, no LOC	LOC me	Dazed/ emory gap, LO no LOC	1C <20 min	30 min- 4 hrs. LOC >2	4 hrs. Began	n Ended

Name:	 Current Age:	Interviewer Initials:	Date:

Step 1	Step 2						
	Loss	s of consciousne	ss (LOC)/knocked	Dazed/N	Age		
Cause	No LOC	<30 min	30 min-24 hrs.	>23 hrs.	Yes	No	

How many injuries total have you had in your lifetime? _____

Step 3	Typical	Effect	Most Severe Effect			A	ge	
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

Interpreting Findings

(Complete in all cases)

After completing the OSU TBI-ID screening interview please refer the individuals to the DU Clinician if <u>one or more</u> of the following conditions are met:

The individual has:

- WORST= Individual reports one moderate to severe TBI. Moderate and Severe TBI indicated by report of loss of consciousness (LOC) of greater than 30 minutes. Yes__ No__
- FIRST= Individual reports TBI with LOC before age 15. Yes_No_
- MULTIPLE= Individual reports:
 - **A.** A period where three or more blows to the head cause altered consciousness.

Yes__No__

B. 2 or more TBIs with LOC within a 3 month period. **Yes__No__**

None of the above: Yes__No__

Completed by:					

For more information about TBI, resources, or the OSU TBI Identification Method visit:

- Brain Injury Alliance of Colorado www.biacolorado.org
- Ohio Valley Center at OSU www.ohiovalley.org/informationeducation

Scoring revised for Colorado

Neuropsychological Screening

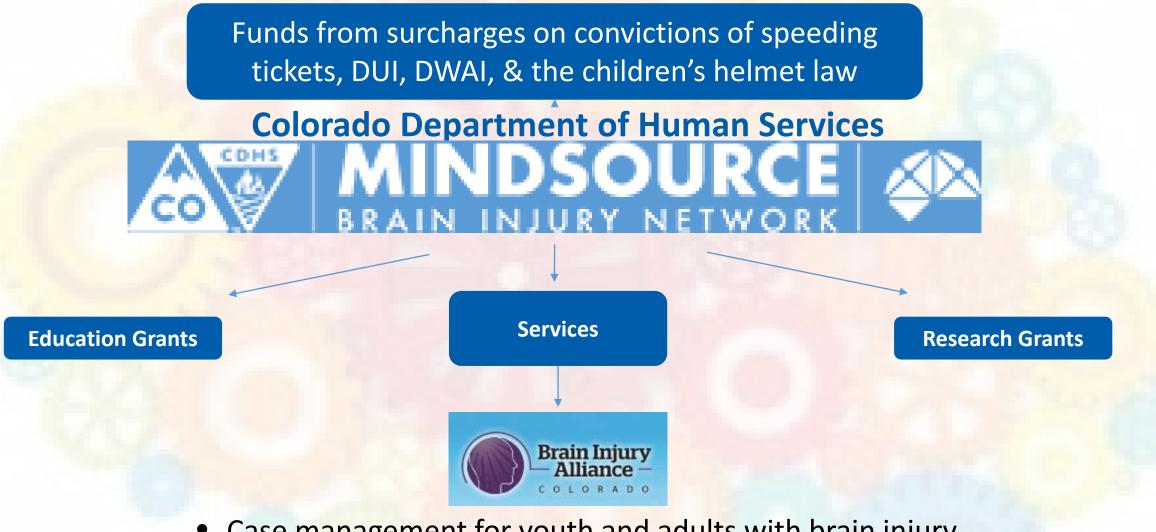
- Clinical Interview
- Automated Neuropsychological Assessment Metric (ANAM) Core Battery (Reeves, Winter, Bleiberg, & Kane, 2007) or Neuropsychological Assessment Battery Screening module (NAB-SM; Stern & White, 2000)
- Effort tests x 3
 - (Meyers & Volbrecht, 2003)

Referral for Support

When individual screens positive for lifetime history, they are referred to the Brain Injury Alliance of Colorado (BIAC):

Brain Injury

- BIAC conducts intake and assesses needs
- Develops a support plan
- Provides care coordination to address identified needs
- Provides consultation to the criminal justice team*
 - * For youth, care coordinators provide education consultation



- Case management for youth and adults with brain injury
- Specialized support and consultation about school-related issues for children/youth with brain injury
 - Brain injury-specific classes and workshops
 - Trainings to community providers about brain injury and resources

Education

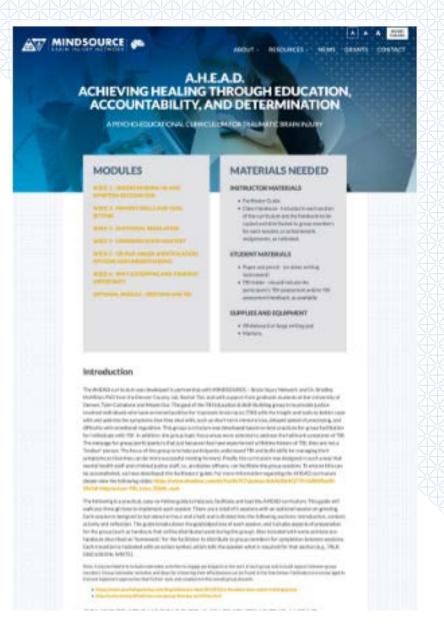
- Training for mental health providers, correctional officers, probation officers, Judges, educators (for juvenile justice referrals)
- Advocacy training for clients

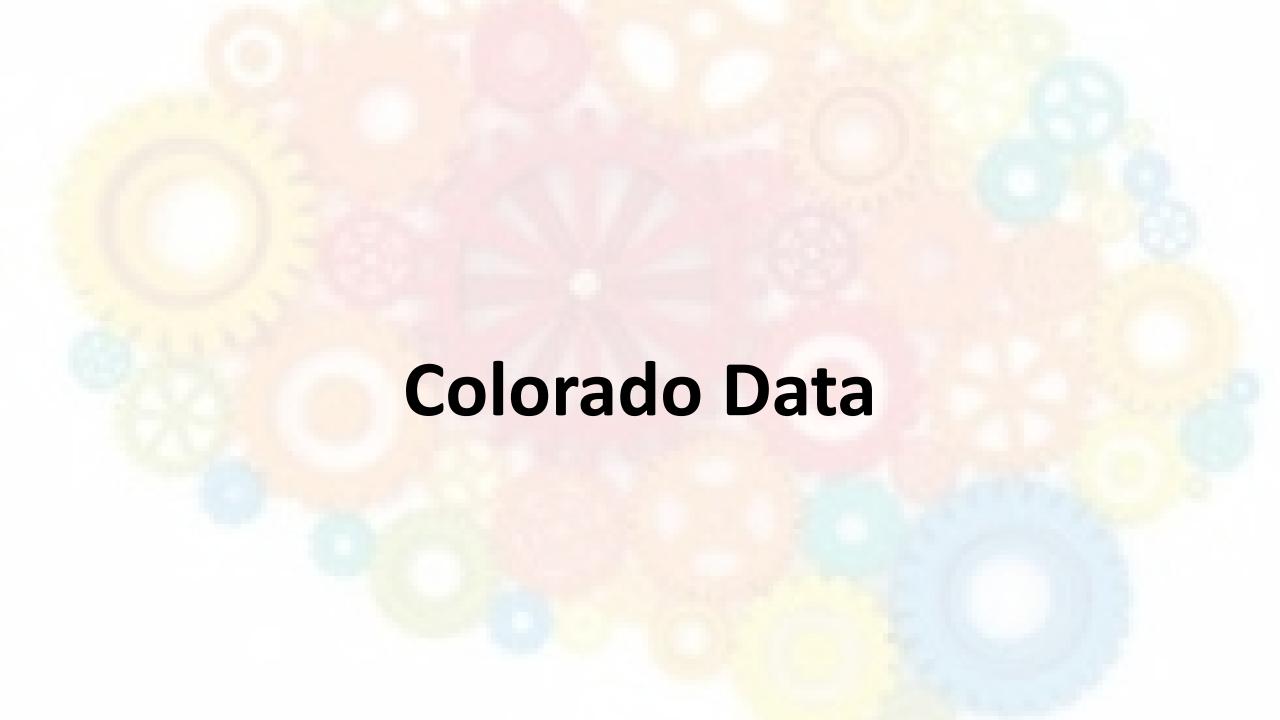
Achieving Healing through Education, Accountability, & Determination (AHEAD)

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

Seven Modules:

- 1. Understanding TBI/Symptom Recognition
- 2. Memory Skills/Goal Setting
- 3. Emotional Regulation
- 4. Communication Mastery
- 5. TBI and Anger
- 6. Stopping & Thinking https://mindsourcecolorado.org/ahead/
- 7. Grief





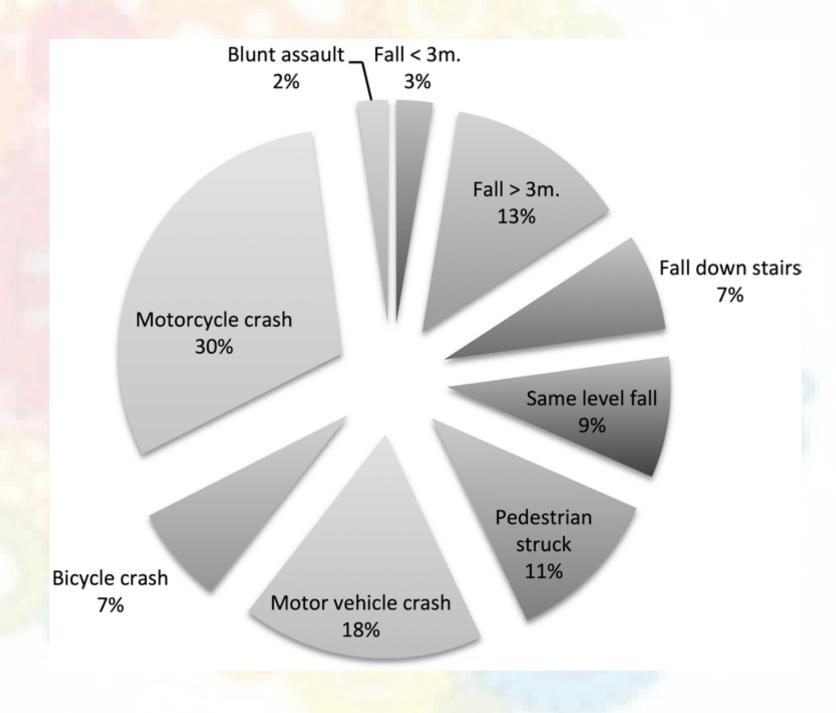
Criminal Justice Entity	Total OSU Screened	Positive Screens	Percent Positive
Arapahoe County Probation	51	28	54.9%
Boulder County Jail (JBBS & JET Units)	369	215	58.2%
Denver County Jail (RISE unit)	1352	360	26.6%
Denver County Jail (Transition Unit)	732	449	61.3%
Larimer County Jail	480	287	59.7%
Adams County Probation (female offender)	31	30	<mark>96.7%</mark>
Adams County Probation (Veterans)	111	47	42.3%
Adams County Probation (sex offenders)	69	28	40.5%
Denver Drug Court	686	299	43.5%
Denver Juvenile Probation	445	82	18.4%
Jefferson County Recovery Court	81	49	60.4%
Total	4,407	1,854	42%

Demographic Data

- Secondary screens=934 (as of 11/1/2019)
- 69% males and 31% females; 56% Single
- 56% identified as White, 21% as Hispanic, 12% as Black or African American, 4% American Indian/Alaska Native, 6% as More Than One race, and 6% as "other"
 - 88% White, 21% Hispanic, 4% Black or African American (Colorado Census, 2015)
- 15% Multilingual
- 10% reported veteran status
 - 7% Colorado Census (2015)

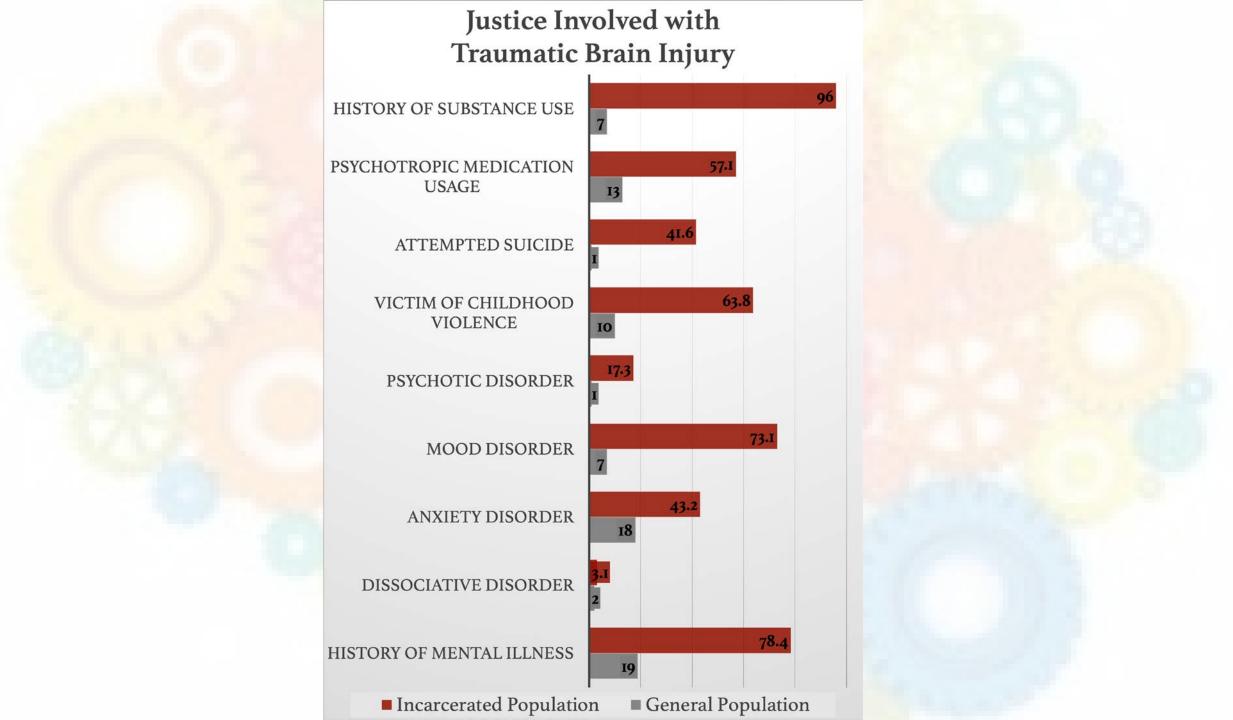
Mechanism of Injury

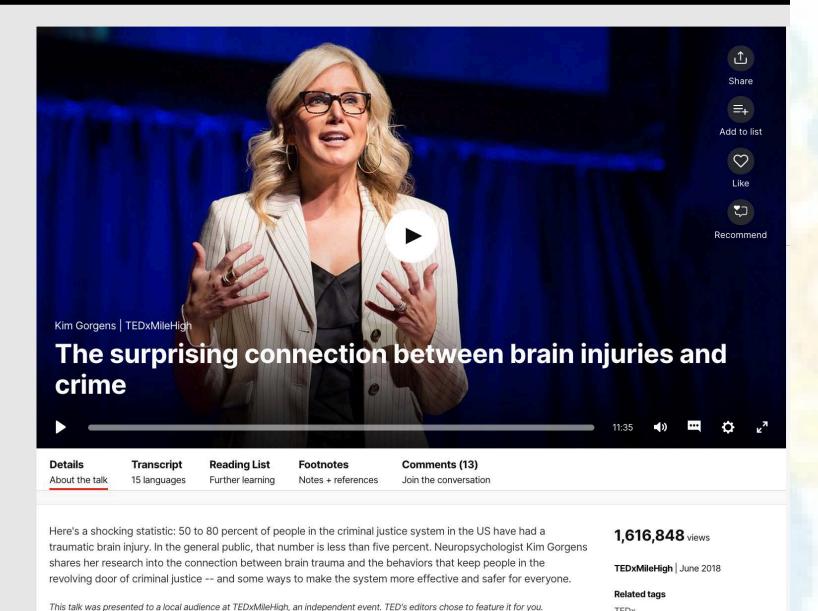
- 74% were due to assault
- 12% were due to motor vehicle accident
- 11% were due to falls
- 2% were due to blasts



Psychosocial Vulnerabilities

- 60% of individuals reported being a victim of childhood violence
 - 15% General population (Finkelhor, Turner, Shattuck, & Hamby, 2015)
- 62% reported victimization in adulthood
 - 2% General population (Bureau of Justice Statistics, 2014)
- 39% reported at least one suicide attempt
 - 4% thoughts, 1% suicide plan in the general pop. (Emory Univ., 2014)
- 54% reported school suspension
 - 26% of young men, 15% of young women (National Center for Education Statistics, 2015)
- 96% reported a history of substance abuse/misuse
 - 7% general population (National Institute on Drug Abuse, 2013)
- 77% of individuals reported at least one mental health diagnosis
 - Vs. 20% (NAMI, 2013)
 - 57% Mood disorders (7%, NAMI, 2013)
 - 34% Anxiety Disorders (18%, NAMI, 2013)
 - 13% Psychotic Disorders (1%, NAMI, 2013)
 - 57% take psychiatric medication
- 74% Comorbid substance abuse and mental illness





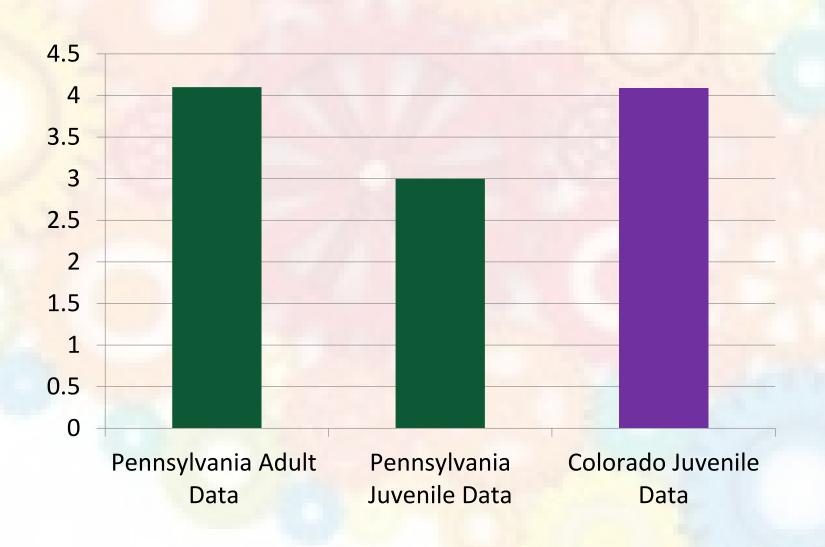
Juvenile Justice Collaboration



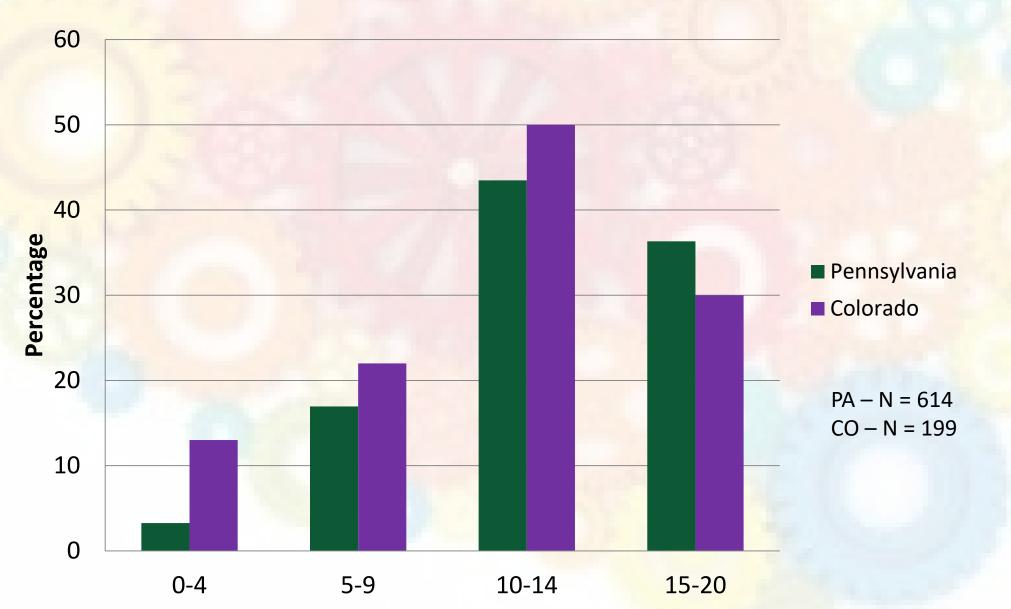
Lifetime History Data Juveniles

Target Site	#Screened	#Screen Positive	Percent Positive
PA County Probation	37	8	22%
Butler			
PA Bucks/	490	229	47%
Montgomery			
County Detention			
PA State Placement	386	101	26%
Lloysville			
CO Denver Juvenile	199	65	33%
Probation			
Recalculation			
Totals	1112	403	36%

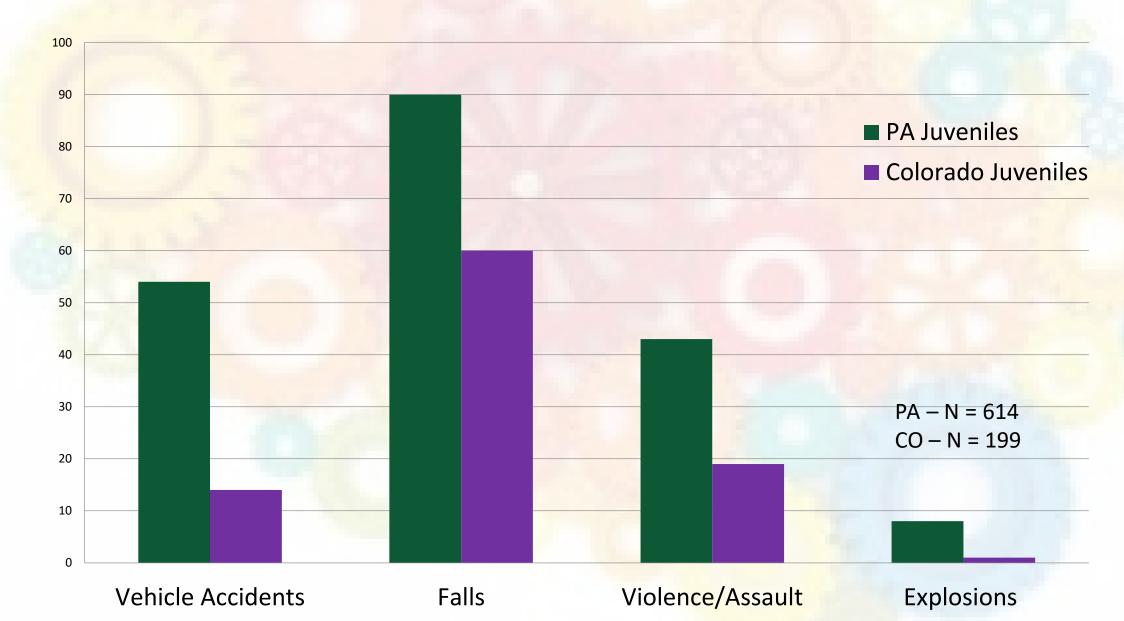
Average Number of Brain Injury Events



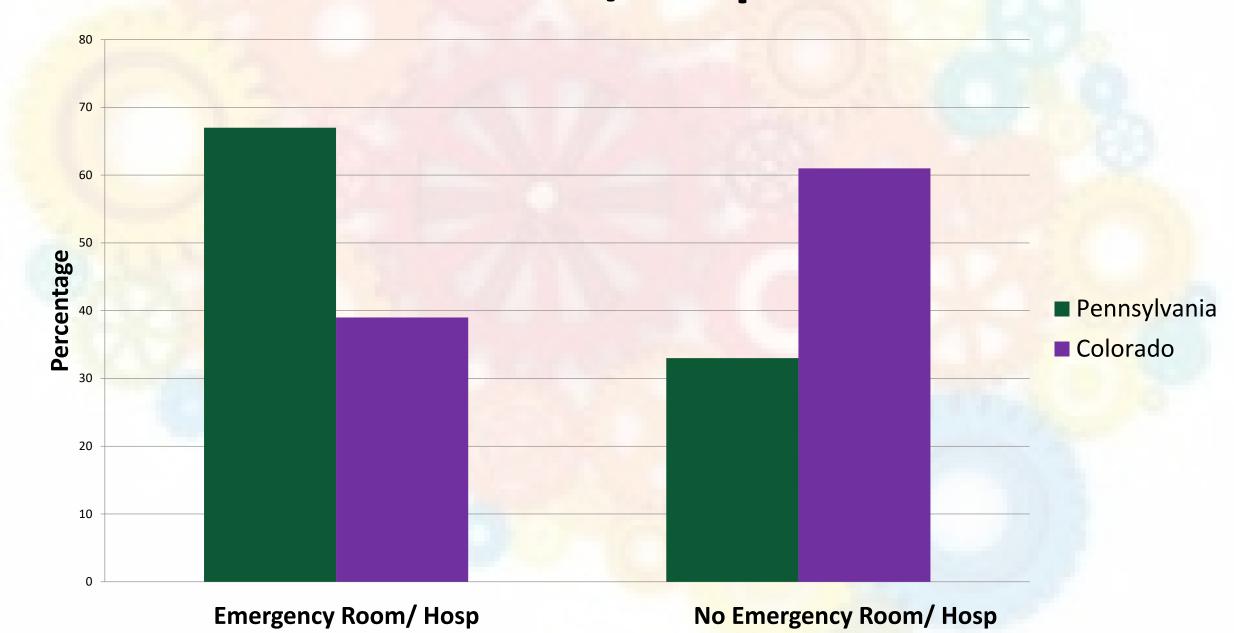
Age at Time of Injury –Juveniles



Mechanism of Injury



Juvenile TBI-related ER/Hospitalization Visits





- 1. Lifetime History Screen—handout
- 2. OPTIONAL Neuropsychological Screening training
 - a) TBI basics
 - b) Screening vs. evaluation
 - c) Review of screening instruments
- 3. Self-report symptom checklist and support materials—handouts

Symptom Questionnaire

- Self-report
 - Online scoring coming soon!
- Customized tip sheets for clients, mental health and criminal justice professionals

SYMPTOMS QUESTIONNAIRE

recent weeks, how much have you ease mark only one circle per item.	been bothere	d by the follow	wing problem	s?	
MEMORY CONCERNS	I do not experience this problem at all	I experience this problem but it does not bother me	I am mildly bothered by this problem	I am moderately bothered by this problem	I am extremely bothered by this problem
Losing or misplacing important items (e.g., keys, wallet, papers)	0	0	0	0	0
Forgetting what people tell me	0	0	0	0	0
Forgetting what I've read	0	0	0	0	0
Losing track of time	0	0	0	0	0
Forgetting what I did yesterday	0	0	0	0	0
Forgetting things I've just learned	0	0	0	0	0
Forgetting meetings/appointments	0	0	0	0	0
Forgetting to turn off appliances [e.g., iron, stave]	0	0	0	0	0
DELAYED PROCESSING	I do not experience this problem at all	I experience this problem but it does not bother me	I am mildly bothered by this problem	I am moderately bothered by this problem	I am extremely bothered by this problem
Trouble following conversations	0	0	0	0	0
Remembering only one or two steps when someone is giving me instructions or directions	0	0	0	0	0
Taking too long to figure out what someone is trying to tell me	0	0	0	0	0

Plain Language Tip Sheets for Clients



Organization Problems

Organization is the ability to use your time, energy or resources in a helpful way to finish goals or tasks. People who have a hard time with organization notice they have problems keeping a schedule, prioritizing, starting tasks, switching from one activity to another, or keeping up with time-sensitive tasks (for example, paying bills, completing paperwork, etc.). Using and practicing the following tips can be helpful:

- To help master your schedule, you can use a notebook, planner, or digital calendar and reminder app on your phone or watch. Review weekly and monthly schedules frequently.
- If you have trouble prioritizing duties, use a system of organization. For example, highlight important events, bill due dates, and other deadlines.
- If you have a hard time remembering important activities or appointments, set up a routine by asking that your regular appointments be scheduled on the same day and at the same time when possible.
- To help yourself switch between tasks, set a timer or use a watch to alert yourself when to wrap up what you're doing, and when to get ready for your next task.²
- If you have a hard time finishing projects on time or correctly, break them down into smaller, simple tasks and cross off each step as it is completed.
- Poor sleep can add to organizational problems. You can review the attached sleep to help improve sleep habits.

Compiled by H. Allo, D. Daugherty, & H. Schuveiller March 11, 2019

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Inhibition Problems/Impulsivity

Impulsivity is when you find it hard to think before you act or say something. You might notice yourself cutting someone off before they finish talking or doing the first thing that comes to mind. You may also find it hard to control your emotions and show them in a way that others will understand. Even though these behaviors are not on purpose, it can be frustrating if you find yourself getting in trouble for your actions. Using and practicing the following suggestions can be helpful:

 Stop → Think → Act! When you notice yourself acting on the first thing that pops into your mind, STOP and count to 3 while you think about the possible outcomes of what you are about to do before you do it.







- Breathing techniques can help you relax when you are feeling out-of-control. A simple exercise that you can do is focus on your breathing for 60 seconds. Breathe in through your nose, hold your breath for 6 seconds, and then breathe out through your mouth.
- Wait until others have finished talking before sharing your thought. If you find yourself disrupting conversations, try silently repeating the question(s) to yourself before offering an answer. This can help you avoid cutting others off when they are speaking.
- If you find it hard to stay focused in any setting, physical or mental breaks can help. For example, try going for a short walk to take a break and refocus.
- When working with others in a group setting, bring a notepad with you to write down your thoughts as they pop into your head. This can help avoid any interruptions that may have been caused by speaking out of turn.
- Write down step-by-step instructions or create a checklist to help yourself complete tasks or instructions
- Poor sleep can contribute to impulsivity. You can review the attached sleep checklist to help promote better sleep habits.

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Attention Problems

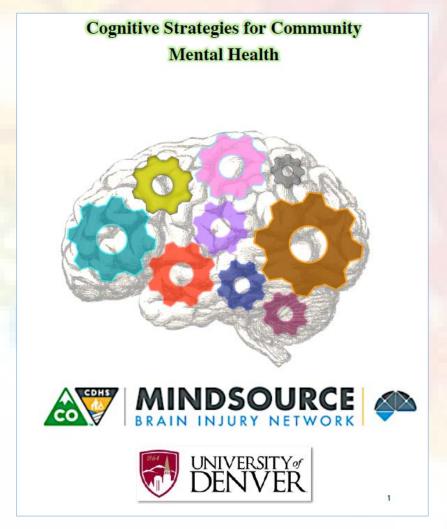
There are different kinds of attention. One kind allows you to think about one thing for a short period of time, another type helps you ignore distractions and another type allows you to shift your attention from one thing to another. People with attention problems have a hard time staying focused during meetings, may get off-topic during conversations, and may have trouble remembering important details. Having trouble finishing tasks, especially when it is noisy or you are distracted, is a common problem. Using and practicing the following suggestions can be helpful:

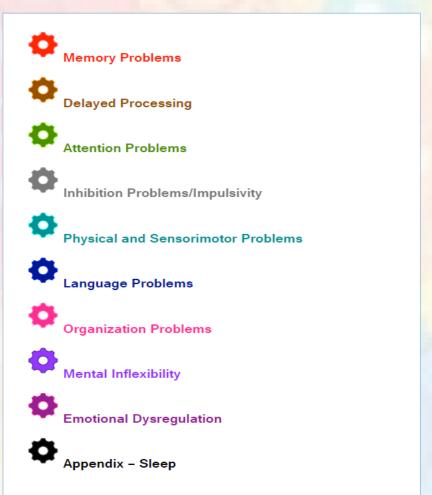
- Recording information can be helpful. To help you remember important details, you
 can take notes or record voice messages after important meetings.
- To help you complete tasks, break them into small steps, create a list and work on only one step at a time.
- Distracting places can make these problems worse (for example, spaces that are noisy, full of clutter, have busy views, or frequent interruptions). As much as possible, work in quiet, non-distracting places.
- 4. When possible, wear earphones to drown out excess noise.
- To help you remember meetings or important dates, use the calendar or reminders on your phone/watch/computer or use a regular paper planner or calendar.
- During important meetings, take a minute to repeat or summarize important points to help you remember.
- Attention can get worse as the day goes on. When possible, try to schedule important appointments earlier in the day.
- Attention can get worse if you don't sleep well. Using the attached sleep guide to help you practice better sleep habits.

Compiled by N. Amundson, M. Aud, & Q. Kais March 11, 2019

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Strategies Guidebook for Community Professionals





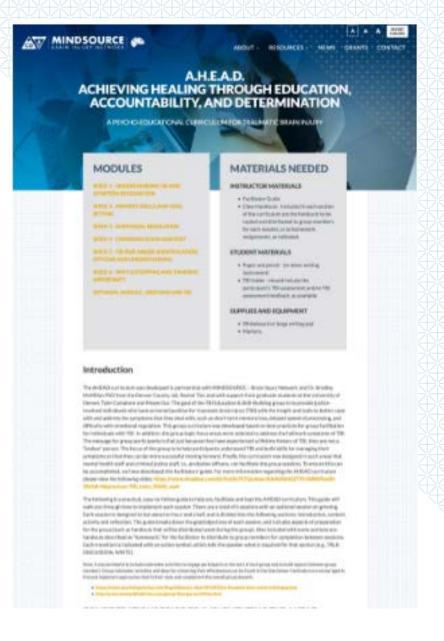
Bookmark These Resources

Achieving Healing through Education, Accountability, & Determination (AHEAD)

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

Seven Modules:

- Understanding TBI/Symptom Recognition
- 2. Memory Skills/Goal Setting
- 3. Emotional Regulation
- 4. Communication Mastery
- 5. TBI and Anger
- 6. Stopping & Thinking https://mindsourcecolorado.org/ahead/
- 7. Grief



Rocky Mountain MIRECC TBI Toolkit



Home

TBI 101

Mental Health/TBI

Justice Involved

Military & Veteran

Resources

https://www.mirecc.va.gov/visn19/tbi toolkit/justice/index.asp

Colorado Kids with Brain Injury www.cokidswithbraininjury.com

Ohio State University Accommodating the Symptoms of TBI

Presented by

Ohio Valley Center for Brain Injury Prevention and Rehabilitation

with contributions from Minnesota Department of Human Services State
Operated Services

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

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

Questions?

Thank you BrainSTEPS!



References

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