

# Addressing Brain Injury within Health Care for the Homeless Settings: Screenings, Interventions and Outcomes

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# Background

- Jan Caughlan –
  - Social Worker at Health Care for the Homeless
  - Long journey of learning about brain injury and thinking about ways to be more helpful and effective
- Caitlin Synovec –
  - Occupational Therapist at Health Care for the Homeless, Baltimore
  - First began working as an OT in mental health – has transitioned to integrated care within HCH, and focusing on the impact of brain injury on individuals who are homeless

# Objectives

1. Understand methods to screen and identify history of brain injury within primary and integrated care settings
2. Understand effective approaches and interventions for clients with a history of brain injury within primary and integrated care settings
3. Understand support and rehabilitation services of clients with brain injury
4. Identify pathways to understanding rehabilitation services and providers within HCH settings

# Behavioral Health Context

- Homelessness has always been connected to:
  - Serious mental illness
  - Serious substance use disorders
- Increasing awareness that additionally, many have cognitive problems that are rooted in examples like:
  - Developmental delay
  - Lead poisoning
  - Brain injuries
- Co-occurring is prevalent

# Background: Why Talking about BI Matters to Us

- TBI screenings among individuals who are homeless have indicated 8-53% of those experiencing homelessness have sustained a TBI, which is **up to 5 times greater** than the general population

[Hwang et al., 2008.; Topolovec-Vranic et al., 2012].

- 5-15% of mild TBI survivors, as well as virtually all survivors of moderate and severe TBIs have one or more semi-permanent or permanent deficits impacting their performance in routine activities

[Hux, Schneider & Bennett, 2009]

- 87% of adults with a reported hx of TBI sustained TBI **PRIOR** to becoming homeless

[Topolovec-Vranic et al., 2014]

- Indicates TBI as a risk factor for homelessness, not just a result of

# Why Talking about BI Matters to Us

- Individuals who experience mild TBI may continue to experience long-term effects, such as short-term memory loss, decreased attention, difficulty reading and writing, navigating in the community, and organizing themselves [Highley, 2008]
- Sustaining even a mild TBI is correlated with an increased likelihood of developing psychiatric, emotional-regulation, and substance abuse issues, and overall poorer health outcomes [Hwang et al., 2008; Topolovec-Vranic et al., 2014]

# Why Talking about BI Matters to Us

- Domestic Violence

- 50% of domestic-violence victims are strangled at some point in the course of their relationship—often repeatedly, over years. Strangulation is not always visible/detectable.

- Those strangled to the point of losing consciousness and survive often experience brain injury—mild or traumatic—not only by cutting off oxygen to the brain but because they are often accompanied by blunt-force trauma to the head.

- These victims are under-screened and under-treated for the TBI(s) they experience.

[Snyder, 2016]

# Screening and Identification

Screening is a hard sell to providers

There are so many screens that we are always asked to add

What do you do with a positive screen anyway?

So why screen???

A little prevalence data never hurt anyone

Modifying treatment approaches based on findings

Improving referrals, connections to care

Accuracy in the problem/diagnostic list

Think about it – at least!





# Screening and Identification - Considerations

- What screen to use?
- Any costs associated?
- Who screens?
- What do you do with the data/findings?
- Partnering with researchers
  - (ha ha – just kidding!)

# Screening for TBI

- Brain Injury Screening Questionnaire
- HELPS Brain Injury Screening Tool
- Ohio State University TBI Identification Method
- Neuropsych evaluation
- Repeatable Battery for Assessment of Cognition (RBANS)

# Screening for TBI

- OSU TBI ID – briefest instrument to use, found to be reliable/valid  
(Corrigan & Bogner, 2007)
- Asks for history of injuries to head or neck, both treated and untreated
- Later rates severity of injury
- Severity indicated by extent of time spent unconscious following injury
- **Weakness – doesn't screen for acquired brain injuries**

Name: \_\_\_\_\_ Current Age: \_\_\_\_\_ Interviewer Initials: \_\_\_\_\_ Date: \_\_\_\_\_

## Ohio State University TBI Identification Method — Interview Form

### Step 1

Ask questions 1-5 below. Record the cause of each reported injury and any details provided spontaneously in the chart at the bottom of this page. You do not need to ask further about loss of consciousness or other injury details during this step.

I am going to ask you about injuries to your head or neck that you may have had anytime in your life.

1. In your lifetime, have you ever been hospitalized or treated in an emergency room following an injury to your head or neck? Think about any childhood injuries you remember or were told about.

No  Yes—Record cause in chart

2. In your lifetime, have you ever injured your head or neck in a car accident or from crashing some other moving vehicle like a bicycle, motorcycle or ATV?

No  Yes—Record cause in chart

3. In your lifetime, have you ever injured your head or neck in a fall or from being hit by something (for example, falling from a bike or horse, rollerblading, falling on ice, being hit by a rock)? Have you ever injured your head or neck playing sports or on the playground?

No  Yes—Record cause in chart

4. In your lifetime, have you ever injured your head or neck in a fight, from being hit by someone, or from being shaken violently? Have you ever been shot in the head?

No  Yes—Record cause in chart

5. In your lifetime, have you ever been nearby when an explosion or a blast occurred? If you served in the military, think about any combat- or training-related incidents.

No  Yes—Record cause in chart

#### Interviewer Instructions:

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

Cause

### Step 2

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

If more injuries with LOC: How many? \_\_\_\_\_ Longest knocked out? \_\_\_\_\_ How many ≥ 30 mins? \_\_\_\_\_ Youngest age? \_\_\_\_\_

### Step 3

Cause of repeated injury	Typical Effect		Most Severe Effect			Age		
	Dazed/memory gap, no LOC	LOC	Dazed/memory gap, no LOC	LOC < 30 min	LOC 30 min - 24 hrs.	LOC > 24 hrs.	Began	Ended

# Brain Injury Screening: OSU TBI-ID Results

## Ongoing problems likely if:

**FIRST:** TBI with loss of consciousness before age 15

**MULTIPLE:** 2 or more TBIs close together, including a period of time when they experienced multiple blows to the head even if apparently without effect

**RECENT:** A mild TBI in the last weeks or a more severe TBI in the last months

**OTHER Sources:** Any TBI combined with another way that their brain function has been impaired

## Worst Injury (1-5):

**1** = no history of TBI

**2** = mild TBI without loss of consciousness, but with dazed and/or memory lapse

**3** = mild TBI with loss of consciousness < 30 minutes

**4** = moderate TBI with loss of consciousness 30 minutes-24 hours

**5** = severe TBI with loss of consciousness >24 hours

# Approaches and Interventions

## Considerations:

- **Physical:**

- Physical injuries that occurred concurrently
- Visual impairment/deficits
- Chronic pain
  - Migraines, headaches
  - Area/site of injury
- Chronic fatigue

- **Mental Health/Emotional:**

- Adjusting to disability and ongoing health issues
- Trauma from cause of injury
  - Assault/violent injury
  - Domestic violence/ongoing abuse
- Pre-morbid or newly onset psychiatric symptoms
  - Low mood, depression, psychosis
- New or pre-morbid substance use/abuse

# Approaches and Intervention: Structural

- **Minimize Environmental Triggers for Behavioral Problems**
  - **Too much stimulation**
    - Keep environment simple
  - **Lack of predictability and clear structure**
    - Give clear instructions and expectations
    - Be consistent with structure and rules
    - Anticipate difficulty with changes in rules, structures, and routines
  - **Overwhelming physical and cognitive demands**
    - Keep instructions and task demands simple
  - **Negative social input**
    - Avoid criticism if possible – e.g. “feedback sandwich”

# Approaches and Interventions: Structural

- **Accessibility:**
  - **Clear methods for accessing providers and care**
    - Phone systems
    - Check-in process
    - Waiting areas
  - **Appointments and scheduling**
    - Systems for reminders
    - Calendars/appointment cards:
      - Linear order
      - Visual of month or days of the week
      - Clearly written
- **Late check-in “grace periods”**
  - Provide clear rules/expectations regarding late policy
  - Reasonable outcomes if arrive to late appointment
    - E.g. allowing client to reschedule within shorter time period



# Approaches and Interventions: Structural

- Staff Education
  - Develop understanding and awareness of brain injury
  - Can easily be viewed as many negative personality or behavioral traits
  - Education for all levels of staff can empower staff to feel as if they can effectively engage with clients with BI
- Education can result in a change in attitude...
  - Resulting in more acceptance of policy and structural changes
  - Can happen more quickly than larger, institutional changes

# Approaches and Interventions

- Educational Instruction and Dissemination
  - Provide clear and concise instructions
  - Written information should be provided in easy to read text and format
  - **Limit verbal instructions to no more than 3 steps**
  - Allow client time to practice and comprehend information given
  - Engage in active vs. verbal learning
    - Demonstrate how they take their medications after being given instructions
    - Ask client to write down information
    - Ask client to summarize information in their own words – repetition is helpful!  
repetition is helpful!  
repetition is helpful!  
repetition is helpful!

# Approaches and Intervention: Individual

- Possible needs for rehabilitation:
  - Memory
  - Attention
  - Management of chronic pain and fatigue
  - Visual impairment
  - Development of awareness
    - Problem/skill areas
    - Safety
  - Executive functioning skills:
    - organization, sequencing, initiation, problem solving & decision making, judgement

# Approaches and Intervention: Individual

- Identify:
  - Is a lack of follow through motivational ... or lack of understanding?
  - Identify level of awareness (see next slide)
- Ask open ended questions
  - Allow client time to process and report information
  - Clients often cover deficits by answering yes/no even if they don't understand
- Mental health approaches
  - Motivational interviewing is highly effective for this population
  - Provide visual aids if client lacks language to describe feelings

# Levels of Awareness

- **Intellectual Awareness** -individual is able to understand at some level, that a particular function or functions is impaired. A greater level of intellectual awareness is required to recognize some common thread in the activities in which they have difficulty
- **Emergent Awareness** -individual is able to recognize a problem when it is actually happening. To do so, they must recognize a problem exists (intellectual awareness), and realize when it occurs
- **Anticipatory Awareness** -individual is able to anticipate a problem will occur and plan for the use of a particular strategy or compensation that will reduce the chances that a problem will occur, e.g. keep and refer to a calendar to support memory for daily schedule

**Crossen et.al (1989) J Head Trauma Rehabilitation**

# Approaches and Intervention: Individual

- Clues to issues in:

- **Memory**

- Inconsistent performance of tasks or daily activities
- Difficulty with recall, especially of new information
- Appears inattentive
- Lacks follow-through
- Is “forgetful”

- **Attention**

- Notice the person “checks out”
- Thrill seeking and risk taking behavior is observed/reported
- Seeks sensory stimulation
- Often appears bored or disinterested (as a consequence, professionals and peers may find the individual difficult to engage, or “self-centered”)

- **Organization/Sequencing**

- Difficulty in identifying tangible plans or action steps
- Lacks follow through once plans are made, or for more complicated action plans
- Lacks consistent method for finding and identifying objects/possessions
- Appears to “shuffle” items



# Approaches and Intervention: Individual

- Assist in developing and consistently using strategies
  - Use of a journal/calendar
  - Create a daily schedule
  - “To do” lists and shopping lists
  - Labeling items
  - Learning to break tasks into small manageable steps
    - SMART goals can be an effective tool
  - Use of a digital recorder/smart phone app
  - Encourage use of rest and low activity periods, naps are to be encouraged!
  - Work on accepting coaching from others
  - Work on generalizing strategies to new situations

# Approaches and Intervention: Individual

- Assist in developing and consistently using strategies
  - Use of a highlighter
  - Alarms (on phone, watch) to move through the day
  - Use of a template for routine tasks, on the job, at home, in the community
  - Use of ear plugs to increase attention, screen out distractions (Parente & Herman 1996)
  - Complete more difficult work in a quiet space
  - Model tasks- e.g. turning on a computer and accessing email etc.
  - Use of pictures, for faces/names, basic information, for step-by-step procedures, - e.g. making coffee
  - Use of a timer, to track breaks at work, the time minimum technique, allocated time to puzzle over a problem or vent a frustration



**Be aware that many strategies & accommodations can support several issues concurrently.**

**Using strategies suggested for memory issues may also support initiation, planning and organizing as well as addressing mental flexibility and self-awareness.**



# Approaches and Interventions: Rehabilitation

Service	Roles	Considerations for HCH clients	Accessibility
Physical Therapy	Assessment, development, and restoration of physical skills impacted by injury including: gait/mobility, use of mobility devices, strengthening.	Outpatient clinics can be stand alone or within hospital settings. Typically requires 2-3 appointments per week with home exercises	Covered by insurance for physical health diagnosis/problem. Generally requires referral from PCP
Speech/Language	Assessment, development, and restoration of communication and language skills, as well as cognition	Outpatient clinics can be stand alone or within hospital settings. May be short in duration due to insurance caps, less available as an outpatient	Covered by insurance post-acute injury, diagnoses are limited. Easiest to access with transition from acute/sub-acute rehab stay.
Cognitive Rehabilitation	Assessment, development, and restoration of underlying cognitive skills	Intensive programs typically require 2-4 hours daily for 6-12 weeks.	Can be part of grant funded program (typically hospitals/universities). Insurance coverage varies.
Occupational Therapy	Assessment, development and restoration of functional living skills impacted by injury, as well as underlying cognition	Outpatient clinics within hospital or stand-alone rehabilitation programs. Typically 1-2 times per week for skill development.	Requires referral from PCP. Insurance coverage varies from state to state.
Neuropsychology	Comprehensive assessment of underlying cognitive skills	Requires ability to tolerate testing 3-6 hours at a time. Usually completed in 1-2 days.	Requires referral and insurance coverage varies from state to state

# Approaches and Intervention: Rehabilitation

- Outcomes from integrating occupational therapy within an HCH site:
- Scope of occupational therapy services:
  - Ongoing Intervention
    - Evaluation of client goals and desired areas of change
    - Individual or group interventions to develop skills to meet desired goals
  - Evaluation and Assessment

# Approaches and Intervention: Rehabilitation

- Scope of occupational therapy intervention services:
  - Skill development for problem areas identified through evaluation
  - Adaptive equipment and modifications
  - Interpersonal and communication skills
  - Developing healthy habits/routines
  - Identifying and engaging in community resources
  - Community mobility
  - Health management
  - Home management
  - Money management/budgeting
  - Meal preparation and planning
  - Home safety assessments and follow up visits to implement recommendations
  - Falls prevention
  - Development of volunteer, work, or leisure roles

# Approaches and Interventions: Rehabilitation

- Outcomes of onsite occupational therapy services:
  - Have received over 150 referrals for OT services in 12 months
    - Over 100 of those referred were seen by OTR in some capacity
  - Occupational therapy is a service sought out by all teams

# Outcomes: Ongoing Intervention

Referred clients within study:

<b>Demographics</b>			
<b>Gender</b>		<b>Frequency</b>	<b>Percentage %</b>
N=91	Male	65	71%
	Female	26	29%
<b>Race</b>			
N=92	White	28	30%
	Non-white	64	70%
<b>Age Group</b>			
N=93	18 - 39 years	20	22%
	40 - 59 years	56	60%
	60 + years	17	18%

# Outcomes: Ongoing Intervention

## Mental Health and Comorbidity N=95

N	Percentage %	Condition*
95	100%	Mental health condition
27	28%	Mental health condition with psychosis
50	89.3%	Mental health condition with substance use
19	20%	Mental health condition with TBI <i>*as recorded in problem list</i>
11	12%	Mental health condition with chronic pain
44	46%	Mental health condition with other medical condition
21	22%	Mental health condition with no comorbidity

# Outcomes: Ongoing Intervention

COPM: (Law, Baptiste, Carswell, McColl, Polatajko, & Pollock, 2014)

- Self-report, semi-structured interview
- *Occupational performance problems* are defined as an occupation a person wants, needs or is expected to do, but can't do, doesn't do, or isn't satisfied with the way they do.
  - The client rates the importance of each activity in their life on a scale of 1-10 (1 least important, 10 most)
  - The client chooses up to 5 problems that are most important or pressing to focus on within intervention
  - For each of the 5 problems, the client rates:
    - 1 – 10 on their performance (1 is not able to do it at all, 10 is able to do it extremely well)
    - 1 – 10 on their satisfaction (1 is not at all satisfied, 10 is extremely satisfied)
    - The performance and satisfaction ratings are each averaged, resulting in a total performance and total satisfaction score
      - Scores are re-rated at intervals of 60 days and/or when OT services are ended
      - A change in score of 2 points or greater is considered “significant”



# Outcomes: COPM

## Paired Samples t-Test (N = 32)

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
<b>Pair 1</b>	COPM Initial Performance Score – COPM Follow-up Performance Score	1.9594	2.2643	.4003	-2.7757	-1.1430	4.895	31	.000
<b>Pair 2</b>	COPM Initial Satisfaction Score – COPM Follow-up Satisfaction Score	2.4469	2.3090	.4082	-3.2794	-1.6144	5.995	31	.000

- **Both client rated performance and satisfaction scores improved by 2 points, which is considered significant.**
- **Demonstrates positive outcomes following OT intervention.**

# Approaches and Intervention: Rehabilitation

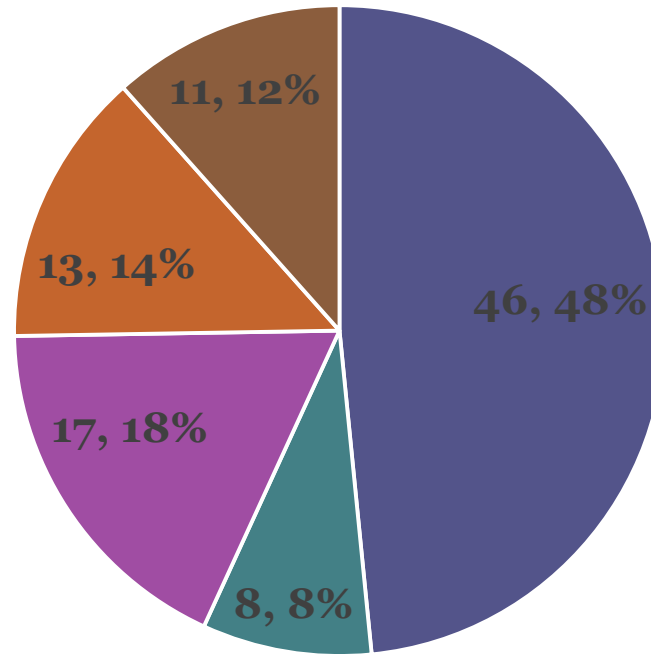
- Scope of occupational therapy services:
  - Evaluation and Assessment:
    - OSU TBI ID Screen
    - Assessment of cognition and functional implications
    - Assessment of functional and self-care skills

# Outcomes: OSU TBI-ID

## Ohio State University Traumatic Brain Injury (TBI) Identification Score (N=95)

**52 % of clients  
screened had at  
least one TBI.**

**44% of clients  
had sustained a  
TBI with LOC**



- No history of TBI
- Mild TBI without LOC
- Mild TBI with LOC
- Moderate TBI
- Severe TBI

# Outcomes: Problem list vs. Screening

- Per the problem list, 20% of clients had a reported history of brain injury
- OSU TBI Screening indicated 52% of clients had experienced a TBI (44% with LOC)
- Crosstabulation indicated that there was a statistically significant relationship between the OSU TBI ID results and the problem list, supporting the need to implement TBI screens to gather a full medical history and problem list

*\*All clients within this study had a MH diagnosis*

# Outcomes: Cognitive Function

Assessment tools used:

- Allen Cognitive Screen (ACLS-5): is an activity-based screening tool developed to **assess the cognitive level** of an individual. This cognitive level relates to functional performance for ADL and IADL tasks and can indicate supports needed or for further testing (Allen et al. 2007).
- Executive Function Performance Test (EFPT): was designed to examine the carrying out of four basic tasks, simple cooking, telephone use, medication management, and bill payment. This test identifies the client's executive performance skills and cuing needed to complete the basic tasks. (Baum & Wolf, 2013)

# Outcomes: Cognitive Function

- There was not a statistically significant relationship of client performance between the assessment tools used.
- There was a not a statistically significant relationship between diagnosis and performance on assessments, except for clients with a TBI and the EFPT.
- This indicates a need to complete functional assessments or observe function, as a cognitive screen does not fully capture a client's individual experiences and functional abilities; nor does diagnosis indicate function.
- Use of the screen provides opportunity to understanding learning and capacity for learning for novel tasks, while the function based allows understanding of current skills.

# Outcomes: Clinician Perspective

- 5 Providers who had referred clients for occupational therapy were interviewed.
- The interviews were reviewed for themes, which are reflected in the table.
- Providers consisted of Supportive Housing providers, physicians, and a director.

Theme Number	Thematic Category
Theme One	Occupational therapy referral used to identify functional deficits Function vs. diagnosis Cognition/TBI
Theme Two	Occupational therapy provides an understanding of clients' functioning Within the community/home Through interventions
Theme Three	Need for more occupational therapy services and resources
Theme Four	Occupational therapy provides depth and adds quality to other providers' sessions as well as another perspective
Theme Five	Collaborative approach Sharing the load Value of teamwork

# Support Services for Individuals with BI

- Make friends with your local Brain Injury Association
- Go to Brain Injury conferences
- Talk to local rehab programs
- Find out what your state is doing
- Be the support you seek for your clients



# Support Services for Individuals with BI

- Challenges Associated with Existing Rehabilitation Programs
  - Programs tend to target immediate post-acute
    - Referral streams are mostly from hospitals
    - Focus is on more severe injuries
  - Programs that target later issues can be very intensive
    - Concussion program in Maryland requires several hours 5 days/week
  - Important to check them out – your results may vary!

# Lessons Learned, Challenges, and How to Grow

- Reimbursement:
  - No FQHC reimbursement for clients with Medicare
  - Many referrals for “non-billable” diagnoses once services and awareness of OT grew
  - More restrictions on billing and authorizations
    - Not able to “back bill” for services
  - Not able to bill for medical or substance use only diagnoses
  - A LOT of time spent talking to Medicaid authorizations staff asserting the need for clients to have OT
  - Continued need to submit authorizations every 30 days, and can only be submitted by the OTR
  - IS reimbursed by MA and provides funding support for position

# Lessons Learned, Challenges, and How to Grow

- Making it work within your setting:
  - Explore various options for billing
    - Direct reimbursement: medical or mental health
    - FQHC reimbursement
  - Advocate for how OT (or other rehab) services can prevent costly health expenses
    - Minimize re-housing for supportive housing programs
    - Minimize ER visits
    - Identify ongoing support needs to prevent problem areas in the community



All of these support Triple Aim Models, as well as US goals to reduce impact of “Super-Utilizers”... often our clients!

# Lessons Learned, Challenges, and How to Grow

- Developing relationships with rehabilitation providers:
  - Contact state associations to develop relationships and find providers interested in establishing relationship/roles
  - Contact educational programs
    - Programs often require students to develop programs or have rotations within mental health and community settings, and are typically looking for sites

# Case Examples

# Questions

# Resources

- I want more training!
  - [www.brainline.org](http://www.brainline.org)
    - Webinars (free, \$\$ to earn CEU)
    - Resources for providers and families
  - American Congress of Rehabilitation Medicine
    - Published textbooks
    - Bi-Annual conference and training for providers
  - State Brain Injury Associations

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