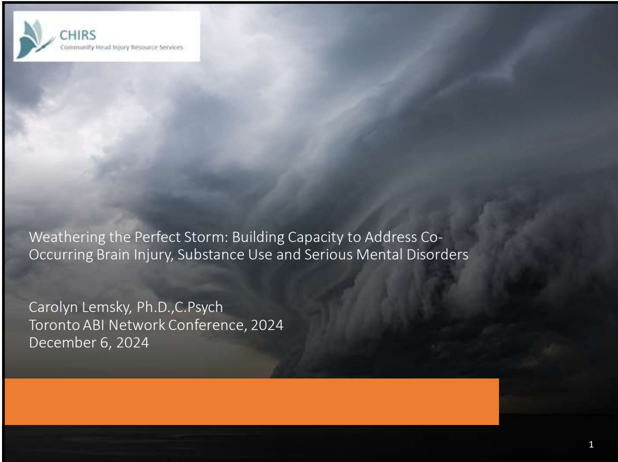

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Disclosures

Dr. Lemsky received funding for this work by the Substance Abuse and Mental Health Administration, Mid-America Technology Transfer Center and the National Association of State Head Injury Administrators.

Earlier versions of this work were funded by the Ontario Neurotrauma Foundation

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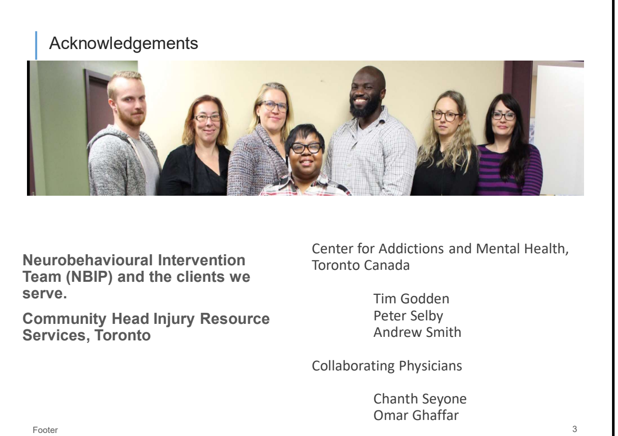

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Overview

What's happening now…

What we'd like to see more of…

- Evidence- based intervention for co-occurring brain injury and substance.
- Promising practices
- NBIP as a program example

- Facilitating partnerships between mental health, addictions and ABI providers.

4

4

Brain injury and behavioural health difficulties have common risk factors

Non-institutionalized adults
1 in 5

People seeking treatment for SUD
2 - 3 in 5

Psychiatric Inpatients
2 - 3 in 5

Co-occurring Disorders
3-4 in 5

5

Moderate to Severe TBI

Non-institutionalized adults
3-6%

People seeking treatment for SUD 15-20%

Psychiatric Inpatients
20 %

Unhoused
12 to 15 %

6

Jessie

44- year-old woman who sustained her injury as the result of an assault at age 21.

- Severe Substance Alcohol Use Disorder.
- Severe mixed aphasia.
- Living on her own in the community with some support from family and friends.
- She is unhappy, recently enjoyed a detox stay.
- She expresses a desire for a sober lifestyle.
- She wants to attend inpatient treatment.
- Negative interactions with ABI service providers has made her reluctant to participate in any ABI services.

7

Tom

- 56-yearold man. Diagnosed with Wernicke's encephalopathy. Moderate to severe impairments of executive functioning, moderate memory impairment.
- Lives with aging parents because when he returns to his own home he inevitably drinks in a harmful fashion.
- Expresses a desire to abstain. Unable to structure daily activities independently.

8

Andrew

- History of Childhood adverse events
- 25 year-old who used cannabis regularly since early adolescence.
- Severe brain injury at 15 years. Ongoing Cannabis use.
- Developed Psychotic Disorder beginning at age 19.
- Failed housing placements as the result of verbally aggressive behaviour.
- Unhoused. Refuses treatment for psychotic disorder.
- Despite a community treatment order he has been lost to care for 4 months.

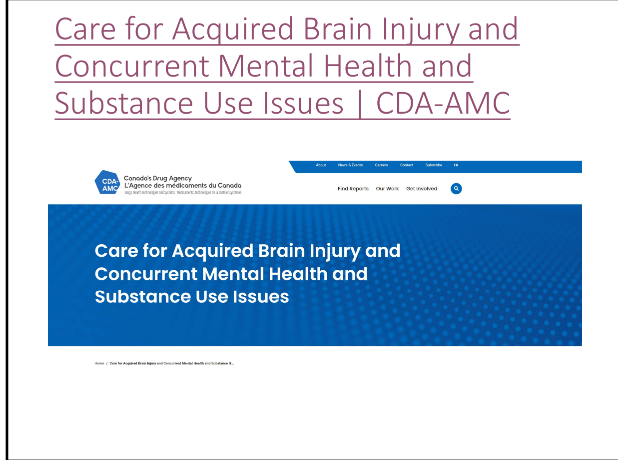
9

History of brain injury is a marker for symptom complexity

- Brain injury is associated with health complications such as seizures.
- History of brain injury is associated with more and more severe psychiatric symptoms.
- History of brain injury increases the risk of suicide three-fold.
- Problems with self regulation
- Problems with cognitive functioning

10

Care for Acquired Brain Injury and Concurrent Mental Health and Substance Use Issues | CDA-AMC



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The literature review and survey aimed to address the following questions:

- What systems and services are in place in Canadian jurisdictions for the care of individuals with ABI and concurrent mental health conditions and/or substance use disorders?
- What are the integrated patient-centred care centres that exist in Canada for individuals with ABI and concurrent mental health conditions and/or substance use disorders?
- What are current needs and gaps related to the care of individuals with ABI and concurrent mental health conditions and/or substance use disorders?

12

Survey Results

The survey results highlighted that while mental health and substance use services do exist, there is a need for effective integration between agencies, systems, ministries, and funding sources, given the needs of individuals with ABI and concurrent mental health conditions and/or substance use disorders. **Some community associations have recognized the needs of this unique population and have begun collaborations and cross-training their health care staff between these care sectors."**

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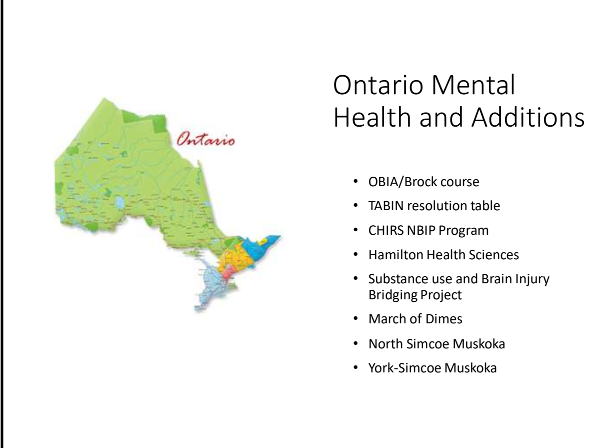

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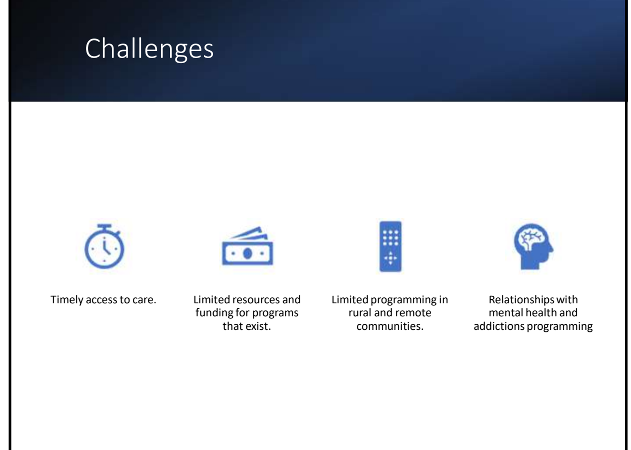

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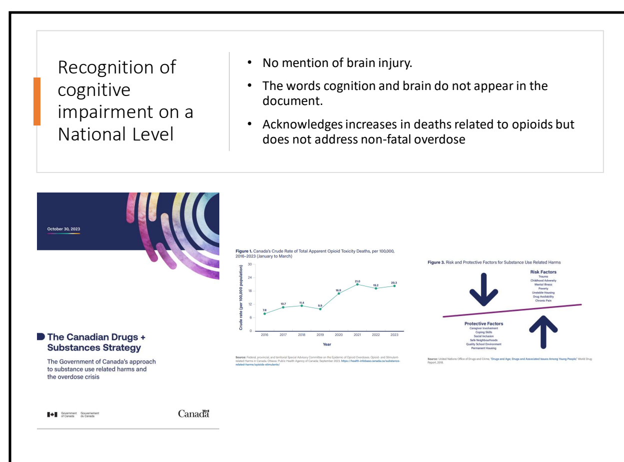

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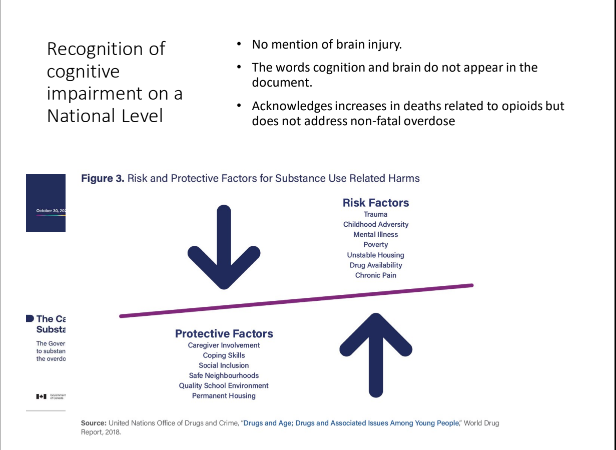

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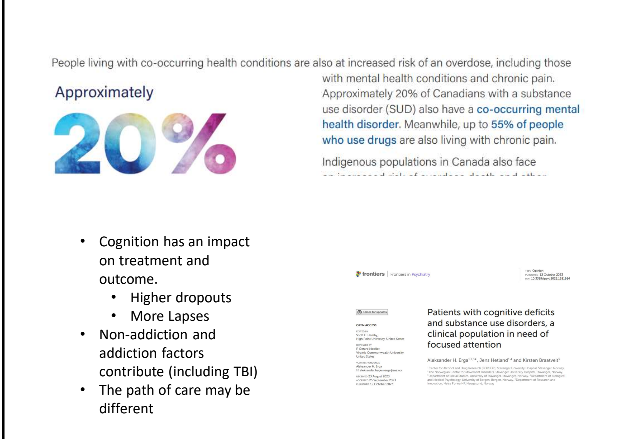

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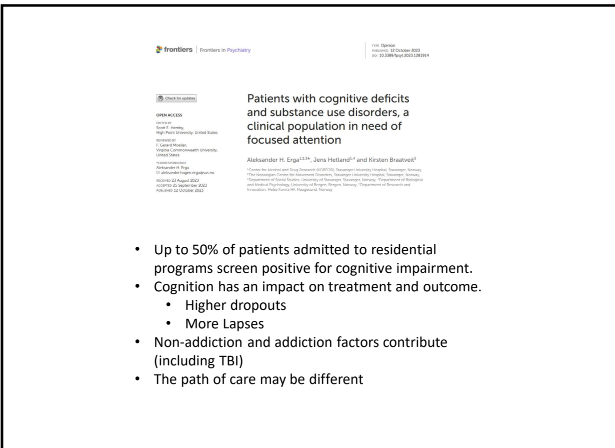

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According to data from the Canadian Institute of Health Information, some 5,807 overdoses were recorded at Canadian hospitals (not including Quebec) between April 2022 and March 2023.

Of those, 327 suffered anoxic brain injury, meaning their brain was damaged due to a lack of oxygen. Anoxic brain injury is just one of the ailments that can affect overdose survivors. Statistics on the others are scarce.

Opioid-related overdoses with and without anoxic brain injuries in 2022-23

Province/Territory	Non-anoxic brain injuries ▼	Anoxic brain injuries
Ontario	2,045	106
British Columbia	1,868	129
Alberta	896	66
Saskatchewan	246	6
New Brunswick	117	N/A
Manitoba	111	11
Nova Scotia	83	N/A
Newfoundland and Labrador	67	0
Prince Edward Island	17	N/A
Yukon	16	0
Northwest Territories	12	0
Nunavut	2	0
Canada	**5,480**	**327**

Data not available for Quebec. Anoxic injury not available for Prince Edward Island, Nova Scotia and New Brunswick

Source: Canadian Institute for Health Information (CBC)

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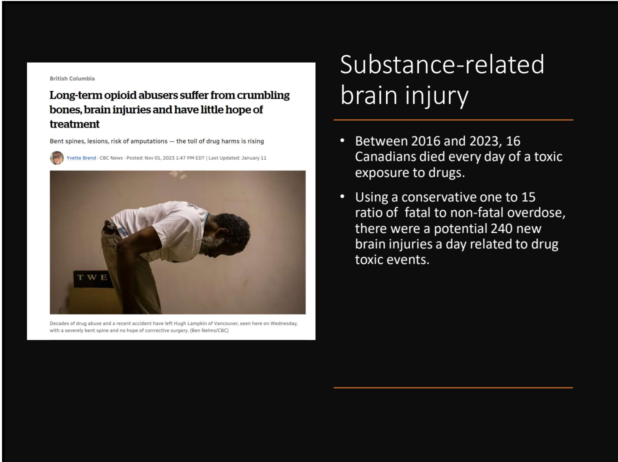

British Columbia

Long-term opioid abusers suffer from crumbling bones, brain injuries and have little hope of treatment

Bent spines, lesions, risk of amputations — the toll of drug harms is rising

Yvette Brend · CBC News · Posted: Nov 01, 2023 1:47 PM EDT | Last Updated: January 11

Decades of drug abuse and a recent accident have left Hugh Lampkin of Vancouver, seen here on Wednesday, with a severely bent spine and no hope of corrrective surgery. (Ben Nelms/CBC)

Substance-related brain injury

- Between 2016 and 2023, 16 Canadians died every day of a toxic exposure to drugs.
- Using a conservative one to 15 ratio of fatal to non-fatal overdose, there were a potential 240 new brain injuries a day related to drug toxic events.

22

Hotel study, Vancouver BC.

Characterizing Traumatic Brain Injury and Its Association with Losing Stable Housing in a Community-based Sample

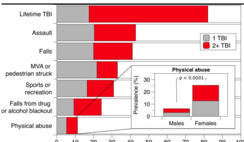
Jacob L Stubbs [1 2], Allen E Thornton [2 3], Kristina M Gicas [1 2 4], Tiffany A O'Connor [2 3], Emily M Livingston [2 3], Henri Y Lu [2 3], Amiti K Mehta [1 2], Donna J Lang [2 5], Alexandra T Vertinsky [5], Thalia S Field [6], Manraj K Heran [5], Olga Leonova [1], Charanveer S Sahota [3], Tari Buchanan [1 2], Alasdair M Barr [2 7], G William MacEwan [1], Alexander Rauscher [8], William G Honer [1 2], William J Panenka [1 2 9]

Affiliations + expand

PMID: 33719613 PMCID: PMC8935598 DOI: 10.1177/07067437211000665

Participants: 285 precariously housed people.

- TBI in 82.1%; 21.4% moderate to severe
- Females reported more brain injuries
- First Mod/Severe injury occurred closer to onset of homelessness
- TBIs that occurred at onset of homelessness were associated with long-term homelessness



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Comprehensive, Continuous, Integrated System of Care (CCISC) Model

- Co-occurring issues and conditions are an expectation, not an exception.
- Care is client-centered and individualized.
- Treatment should be co-occurring.

The best practice intervention is integrated dual or multiple primary treatment, in which each condition or issue receives appropriately matched intervention at the same time.

Minkoff K & Cline C, Developing welcoming systems for individuals with co-occurring disorders: the role of the Comprehensive Continuous Integrated System of Care model. J Dual Diagnosis 2005, 1:63-89

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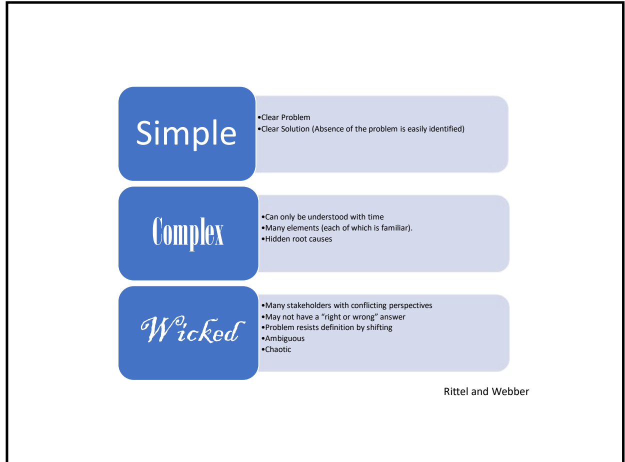

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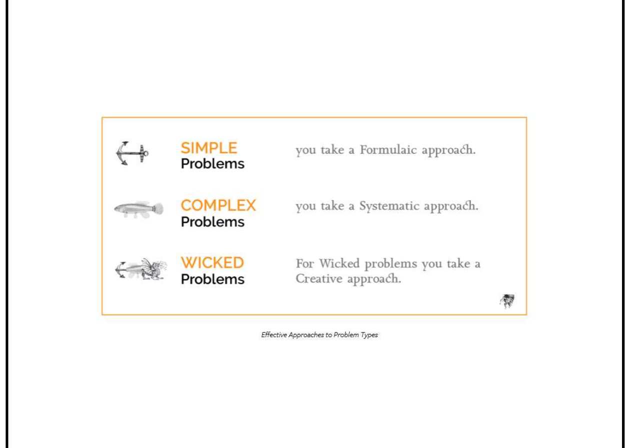

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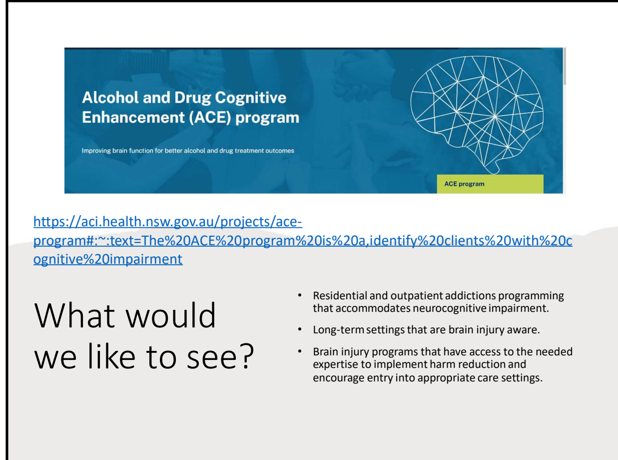

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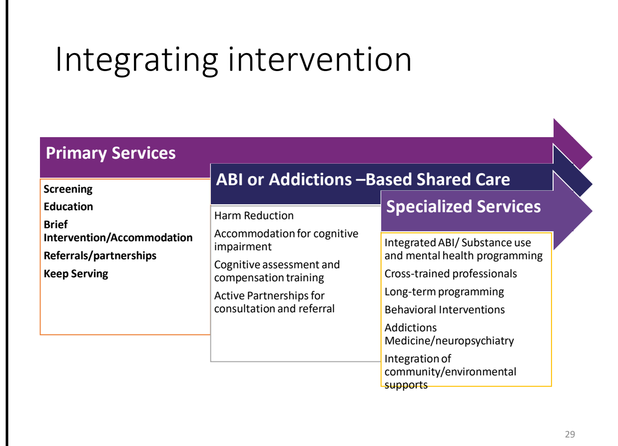

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Integrating intervention

ABI or SUD –Based Shared Care

ABI Services

- Screening for behavioural health disorders
- Recognizing the signs of SUD
- Addressing behavioural health in a rehabilitation context
- Motivational Interviewing
- Harm Reduction Practices
- How to refer to appropriate programs
- **Active Partnerships for consultation and referral.**

SUD/Mental Health Providers

- Screening for Brain Injury
- Recognizing the signs of cognitive impairment
- Accommodating cognitive impairment
- How and when to refer for brain injury services
- **Active Partnerships for consultation and referral**

30

30

Challenges to Integrated Care

Care Silos (Specialized care)
- Limited awareness of the co-occurring diagnoses/treatment
- Restrictive admission policies
- Reduced access to specialized knowledge

Stigma
- Dual stigma related to disability, cognitive impairment and substance use.
- Reduced access to the social determinants of health (housing, healthcare, nutrition and community).

Policy
- Limits on contingency management payments
- Limited support for harm reduction programming

Footer 31

31

A few myths to address

You need to have very specialized training to help someone with a substance use or mental health disorder.

Treatments with the strongest evidence base resemble interventions you are already familiar with.

Treatment only starts when a person has a commitment to change.

Harm reduction interventions are useful on their own and may be the path to intervention/support

32

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33

A few myths to address

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Treatment only starts when a person has a commitment to change.

Harm reduction interventions are useful on their own and may be the path to intervention/support

People with complex problems don't change

Longer periods of intervention may be required. Supports may need to fade in over time

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Key Evidence-Based Practices

Interventions with RCT/Meta-analyses	ABI Specific Evidence	Notes
Brief Intervention (FRAMES)	Prevention/Education (e.g. Bogner et al., 2021)	Multi-media key SBIRT - Booster sessions Brain Health/Health focus
Incentives Contingency Management	**(Corrigan et al., 2005)**	**Incentive to attend supported engagement**
Motivational Interviewing	**Small controlled studies Cox, et al., 2003)**	**Increase structure repetition**
Community Reinforcement and Family Training (CRAFT)	**Intensive case management (Bogner et al, 1997) Skills training (Vungkhanching et al., 2007)**	**Elements of CRAFT, but not full model**
Harm Reduction	?	
Pharmacotherapy	Limited RTCs,	

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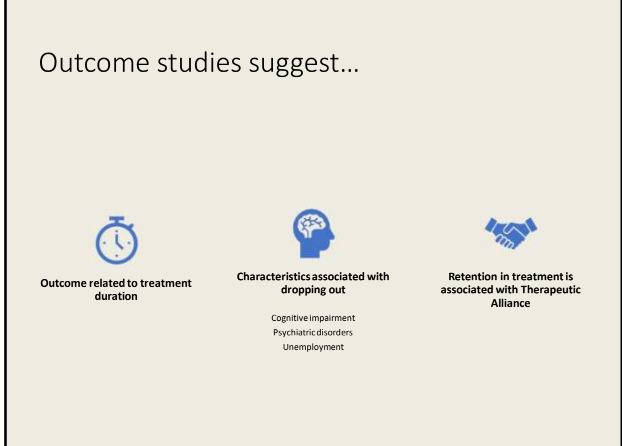

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Contingency Management

- Based on Operant-conditioning literature
- Tangible reinforcement based on verifiable evidence of desired behavior (e.g. abstaining via urine sample).
- 50 years of positive trials related to treatment engagement and treatment outcome.
- Public perception and policy have been the big barriers to implementation.

Substance Abuse and Rehabilitation
Dovepress
REVIEW

A review of contingency management for the treatment of substance-use disorders: adaptation for underserved populations, use of experimental technologies, and personalized optimization strategies

This article was published in the following Dove Press journal:
Substance Abuse and Rehabilitation

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Abstract: This review of contingency management (CM; the behavior-modification method of providing reinforcement in exchange for objective evidence of a desired behavior) for the treatment of substance-use disorders (SUDs) begins by describing the origins of CM and how it has come to be most commonly used during the treatment of SUDs. Our core objective is to review, describe, and discuss three ongoing critical advancements in CM. We review key emerging areas wherein CM will likely have an impact. In total, we qualitatively reviewed 31 studies in a systematic fashion after searching PubMed and Google Scholar. We then describe and highlight CM investigations across three broad themes: adapting CM for underserved populations, CM with experimental technologies, and optimizing CM for personalized interventions. Technological innovations that allow for mobile delivery of reinforcers in exchange for objective evidence of a desired behavior will likely expand the possible applications of CM throughout the SUD-treatment domain and into therapeutically related areas (eg, serious mental illness). When this mobile technology is coupled with new, easy-to-utilize biomarkers, the adaptation for individual goal setting and delivery of CM-based SUD treatment in hard-to-reach places (eg, rural locations) can have a sustained impact on communities most affected by these disorders. In conclusion, there is still much to be done, not only technologically but also in convincing policy makers to adopt this well-established, cost-effective, and evidence-based method of behavior modification.

Keywords: contingency management, novel substance-use treatment technologies, drug- and alcohol-use biomarkers, substance-use disorder treatment

Introduction

Contingency management (CM) is an effective behavioral treatment approach commonly applied to substance-use disorders (SUDs). CM has a long history in basic and clinical research and a deep theoretical background for virtually all types of use disorders.[1] Interestingly, while CM was applied first to the field of alcohol-use disorders,[2–5] only now, after a protracted dormancy in that field, is CM being applied in a manner consistent with what has become a largely standardized approach in the field of drug abuse (ie, delivery of reinforcers in exchange for biochemically verified abstinence) to increase abstinence significantly and consistently.[6,7]

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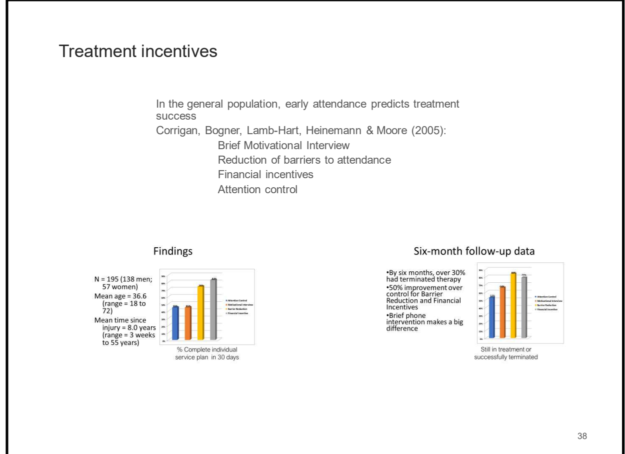

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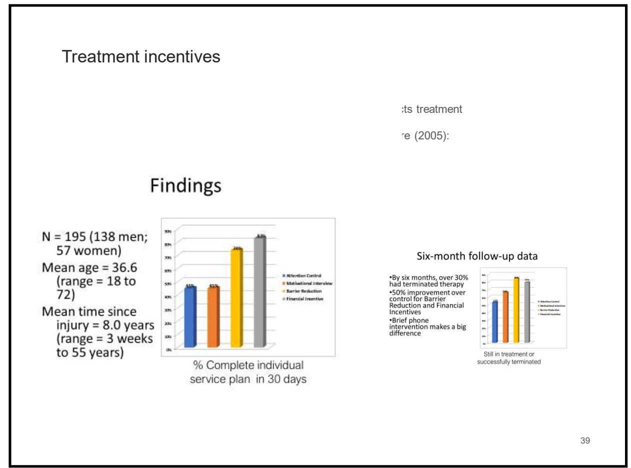

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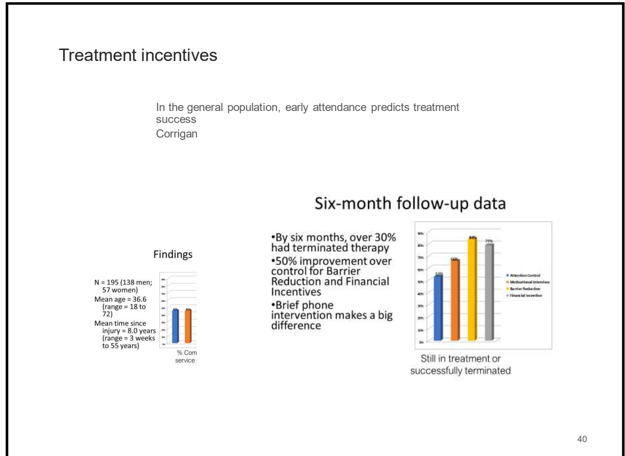

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Why did these interventions work?

Attendance early in treatment increases engagement

Rule-governed learning is easier for many individuals surviving brain injury and enabled engagement

Support to attend sessions enabled engagement

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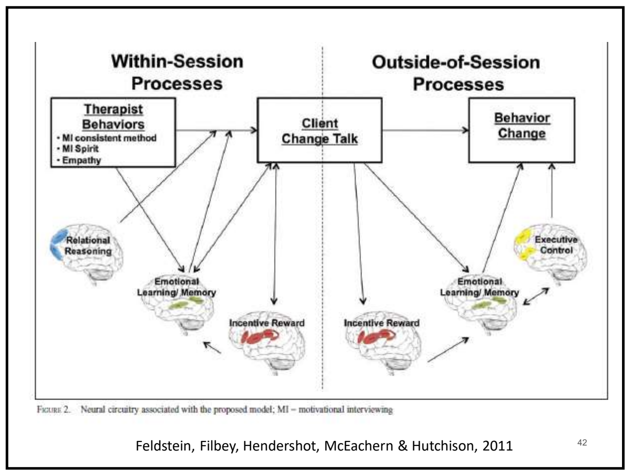

FIGURE 2. Neural circuitry associated with the proposed model; MI = motivational interviewing

Feldstein, Filbey, Hendershot, McEachern & Hutchison, 2011

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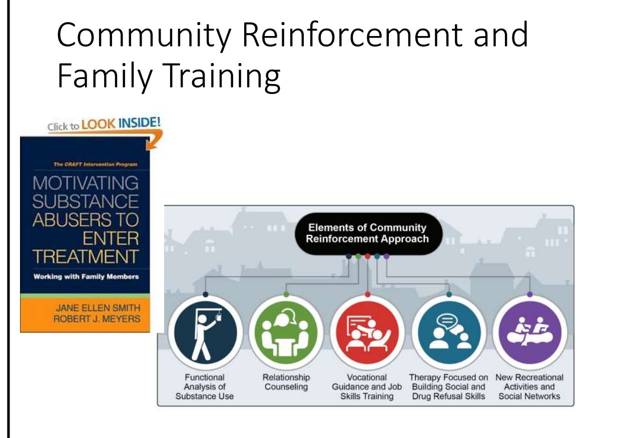

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CRAFT

- Main outcome is entry into treatment
- Works best with full model employed (individual /group treatment)
- Reduces harms and improves family member's mental health and life satisfaction.

› Addiction. 2020 Jun;115(6):1024-1037. doi: 10.1111/add.14901. Epub 2020 Jan 3.

Community reinforcement and family training and rates of treatment entry: a systematic review

Marc Archer [1], Hannah Harwood [1], Sharon Stevelink [1 2], Laura Rafferty [1], Neil Greenberg [1 3]

Affiliations + expand

PMID: 31770469 DOI: 10.1111/add.14901

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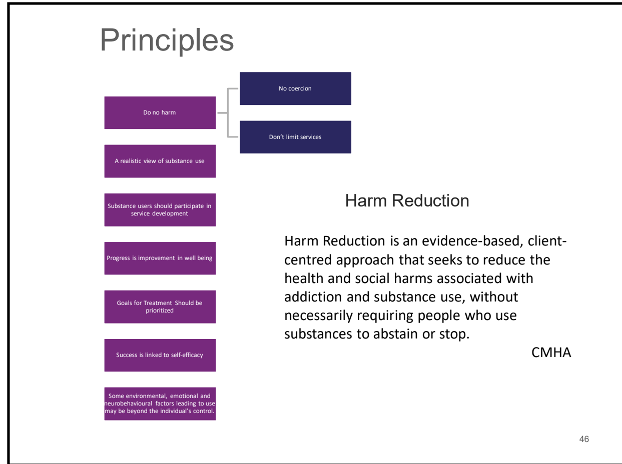

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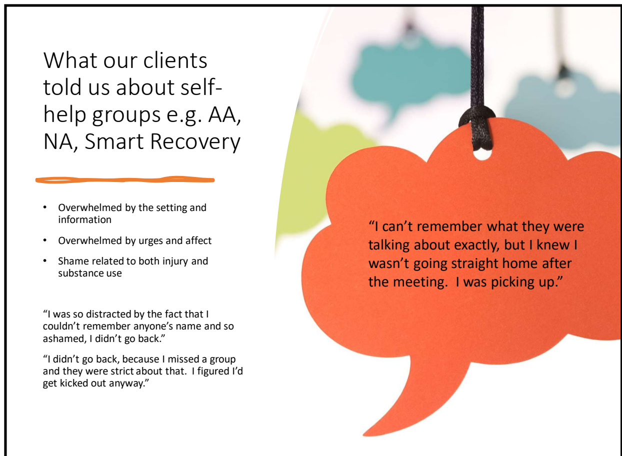

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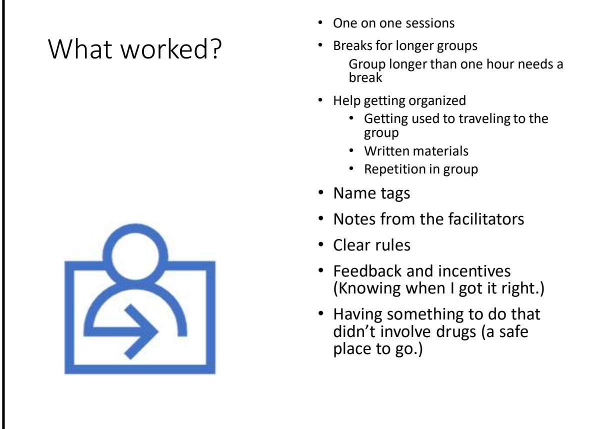

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Outcomes from a modified treatment program

N=67 participants
N=33 screened positive for cognitive impairments

Program materials based on the Original SUBI manual
Collaborative treatment planning
Skill rehearsal, clear goals, celebration of success
Posted calendars
Name tags
Cognitive compensation strategies
Specific supports to assist clients in meeting program expectations

Treatment completion improved by a factor of 5 in people with cognitive impairment (prior to intervention 10% completed, with program changes 50% completed)

- Collings S, Allan J, Munro A. Improving treatment for people with cognitive impairment and substance misuse issues: Lessons from an inclusive residential treatment program pilot in Australia. Disabil Health J. 2022 Jun;15(2S):101295. doi: 10.1016/j.dhjo.2022.101295. Epub 2022 Mar 1. PMID: 35365421.

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Critical elements

- Safe environment
- Structured routines
- Modified materials
- Strength-based programming
- Staff support

Re-Framing self-view
Learning to deal with emotions
Practical skills

Allan, J., Collings, S. & Munro, A. The process of change for people with cognitive impairment in a residential rehabilitation program for substance problems: a phenomenographical analysis. *Subst Abuse Treat Prev Policy* **14**, 13 (2019). https://doi.org/10.1186/s13011-019-0200-y

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Supporting Clients better

Neurocognitive

Cognitive problems require alterations to the **mechanics** of Intervention.

Reduce Distraction
Written Materials
Slow Down

Neuro-behavioural

Problems with self-regulation require alterations to the focus of intervention

Accepting the need for Environmental Supports
External support/Incentives
Skill building and a schedule of competing behaviour

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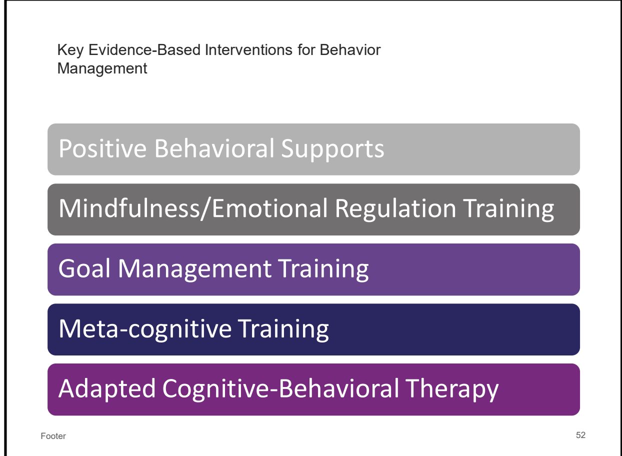

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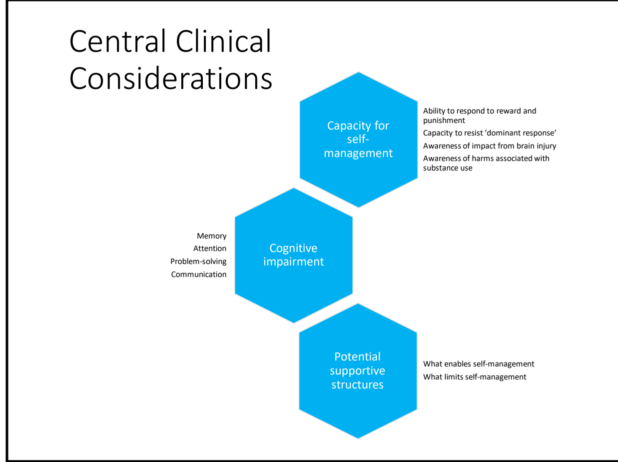

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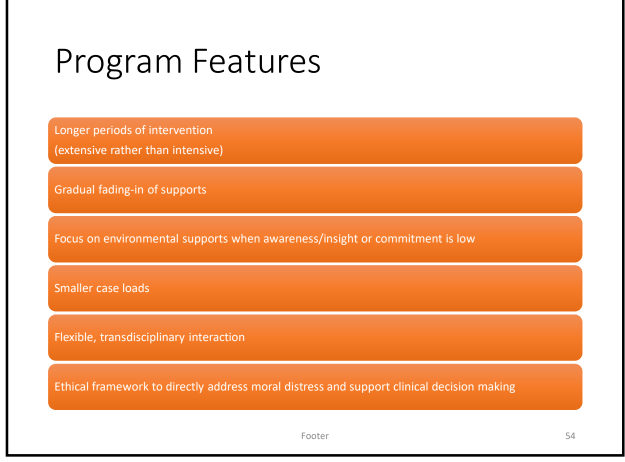

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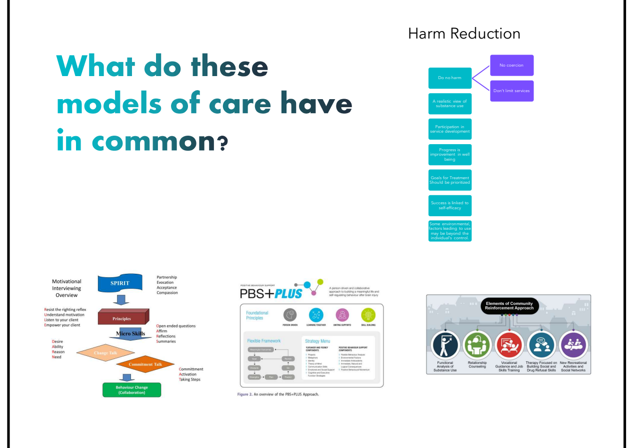

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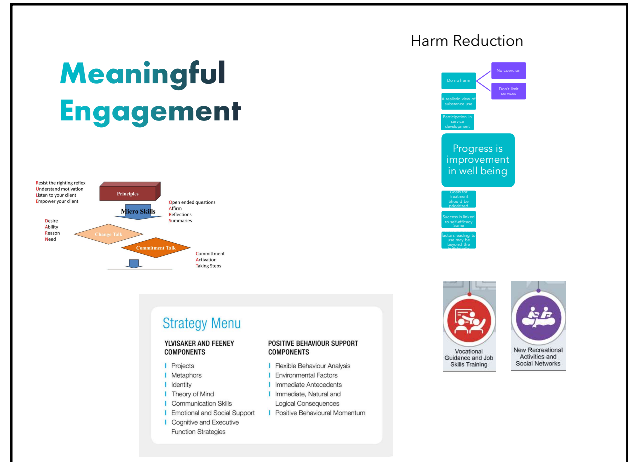

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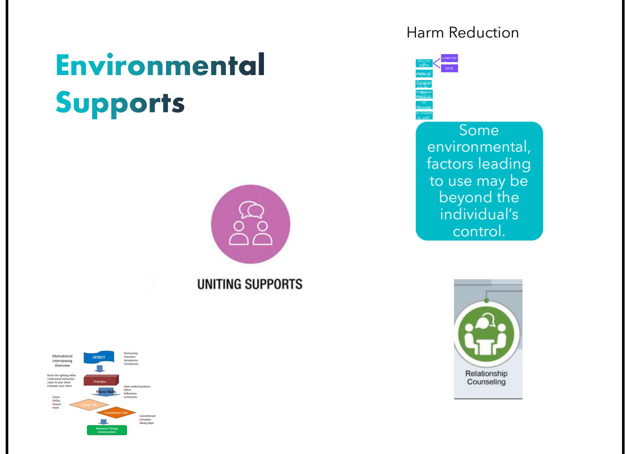

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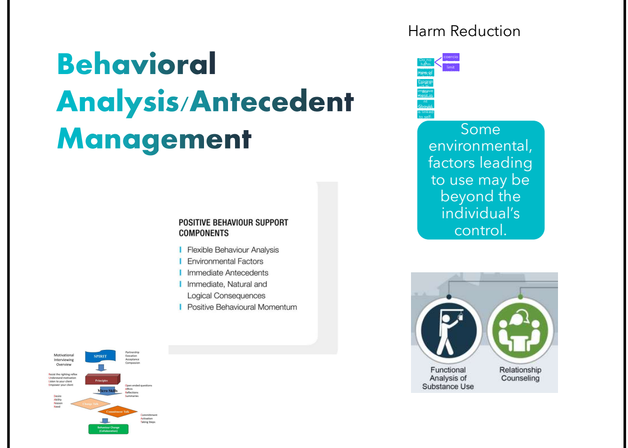

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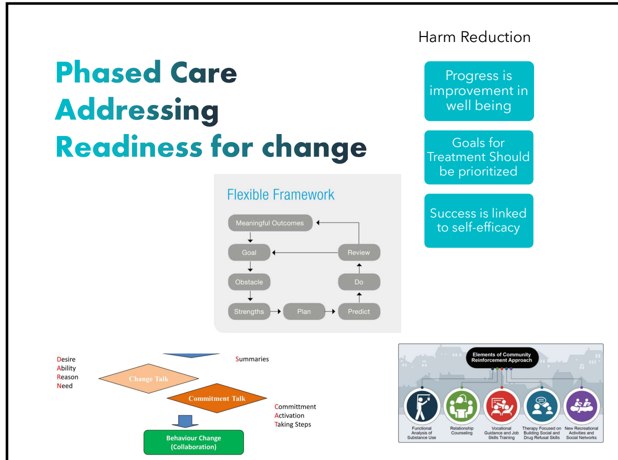

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Program Structure

- Assessment
  - Record review/Mental Health screening
  - Interview
- 16-week Psycho-educational Group
- Weekly one-on-one (with case management support if available)
- Bi-weekly group volunteering
- Access to CHIRS programs/volunteering
- AA closed Step Meeting at CHIRS
- Integrated Clinical Care with transdisciplinary consultation

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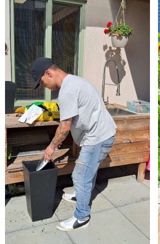
Rooftop Garden: CHIRS Farm to Table resource



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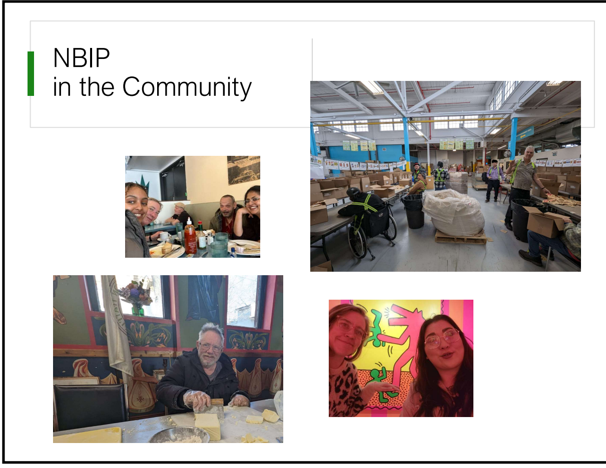
NBIP
in the Community



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Dilemmas and moral distress

- Client shares substances with vulnerable clients
- Client's s/o encourages clients' use
- Client experiences significant harms while intoxicated
- Medical cannabis prescription without clear dosing
- When should treatment be compelled

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Moral distress

- Taking your work home with you
- Feeling anxious
- Feeling 'icky' about a decision
- Conflict among team members or with family members
- Questioning your own beliefs

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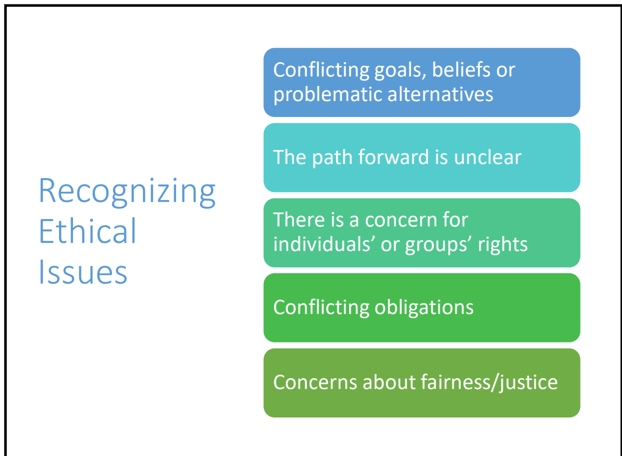

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Ethical Framework

Worksheet

Step 1: Identify Relevant Facts

Step 2: Determine which ethical principles are in conflict.

Step 3: Explore potential options.

Step 4: Act on your Decisions and Evaluate

Ethical Principles

- **Respect for the Dignity of People**
- **Responsible Service Provision**
- **Integrity in Relationships**
- **Responsibility to the Community**

CEN

www.communityethicsnetwork.ca

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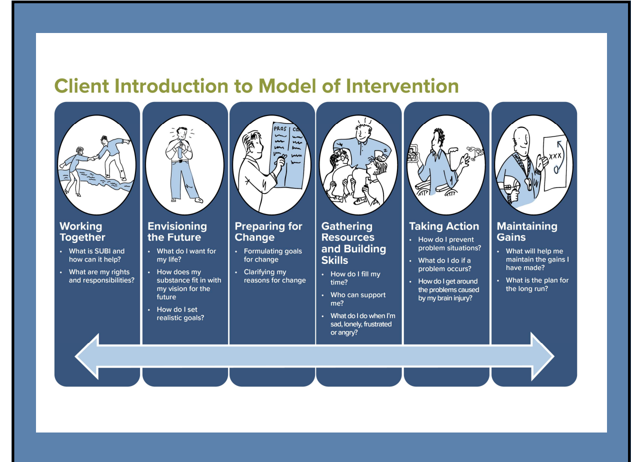

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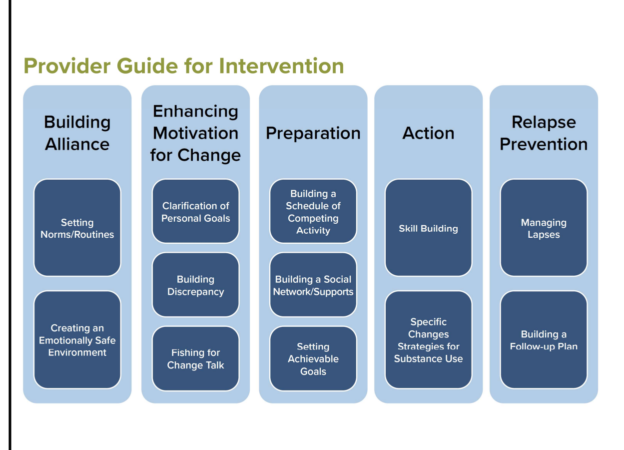

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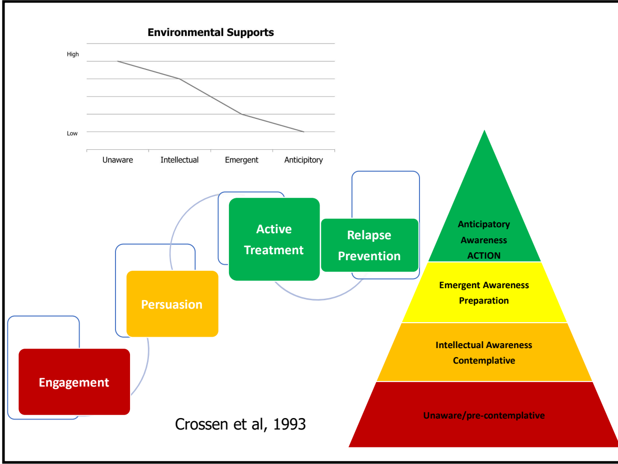

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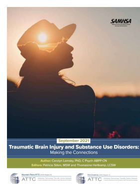
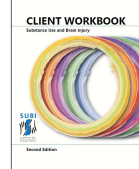
Supporting the development of integrated programing

- Raising awareness
- Screening
- Teach providers what they can do
- Materials to facilitate productive partnerships





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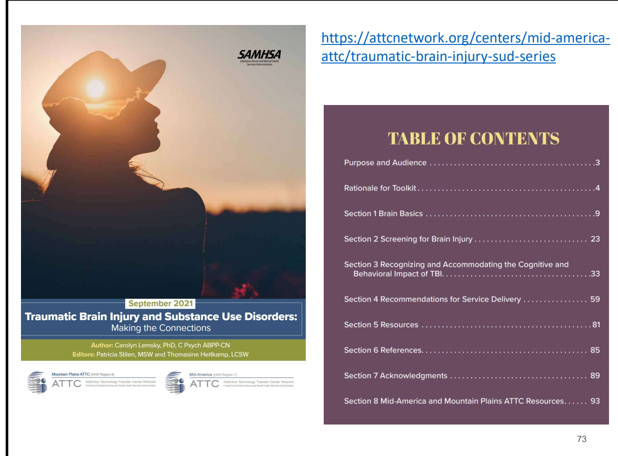

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https://attcnetwork.org/centers/mid-america-attc/traumatic-brain-injury-sud-series

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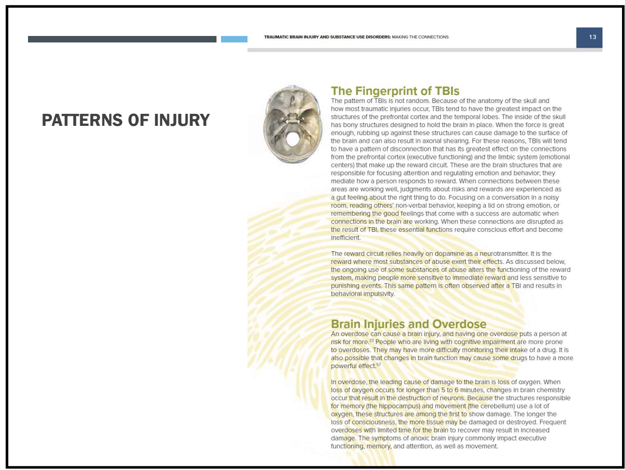

PATTERNS OF INJURY

TRAUMATIC BRAIN INJURY AND SUBSTANCE USE DISORDERS: MAKING THE CONNECTIONS 13

The Fingerprint of TBIs

The pattern of TBIs is not random. Because of the anatomy of the skull and how most traumatic injuries occur, TBIs tend to have the greatest impact on the structures of the prefrontal cortex and the temporal lobes. The inside of the skull has bony structures designed to hold the brain in place. When the force is great enough, rubbing up against these structures can cause damage to the surface of the brain and can also result in axonal shearing. For these reasons, TBIs will tend to have a pattern of disconnection that has its greatest effect on the connections from the prefrontal cortex (executive functioning) and the limbic system (emotional centers) that make up the reward circuit. These are the brain structures that are responsible for focusing attention and regulating emotion and behavior; they mediate how a person responds to reward. When connections between these areas are working well, judgments about risks and rewards are experienced as a gut feeling about the right thing to do. Focusing on a conversation in a noisy room, reading others' non-verbal behavior, keeping a lid on strong emotion, or remembering the good feelings that come with a success are automatic when connections in the brain are working. When these connections are disrupted as the result of TBI, these essential functions require conscious effort and become inefficient.

The reward circuit relies heavily on dopamine as a neurotransmitter. It is the reward where most substances of abuse exert their effects. As discussed below, the ongoing use of some substances of abuse alters the functioning of the reward system, making people more sensitive to immediate reward and less sensitive to punishing events. This same pattern is often observed after a TBI and results in behavioral impulsivity.

Brain Injuries and Overdose

An overdose can cause a brain injury, and having one overdose puts a person at risk for more.[23] People who are living with cognitive impairment are more prone to overdoses. They may have more difficulty monitoring their intake of a drug. It is also possible that changes in brain function may cause some drugs to have a more powerful effect.[57]

In overdose, the leading cause of damage to the brain is loss of oxygen. When loss of oxygen occurs for longer than 5 to 6 minutes, changes in brain chemistry occur that result in the destruction of neurons. Because the structures responsible for memory (the hippocampus) and movement (the cerebellum) use a lot of oxygen, these structures are among the first to show damage. The longer the loss of consciousness, the more tissue may be damaged or destroyed. Frequent overdoses with limited time for the brain to recover may result in increased damage. The symptoms of anoxic brain injury commonly impact executive functioning, memory, and attention, as well as movement.

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SUBSTANCE	NEUROLOGICAL EFFECTS	COGNITIVE EFFECTS
ALCOHOL[12, 48]	• Associated with brain atrophy, particularly the Hippocampus (memory system). • Thiamine deficiency may cause a severe short-lived condition (Wernicke's encephalopathy) or result in lasting learning and memory problems (Korsakoff's syndrome).	Memory Executive Functioning: • Visual-Spatial abilities.
CANNABIS[50]	• Some evidence for atrophy in the Hippocampus (memory system) and changes in connectivity between the frontal lobes and limbic system. • May have a greater impact on the developing brain.	Memory Executive Functioning.
METHAMPHETAMINE[51, 52]	• Widespread damage to dopamine receptors, with cell loss in the emotion and reward system (limbic system), and Hippocampus (memory system).[56]	Memory Executive Functioning: • Inability to suppress habitual behaviors. • Sensitivity to short-term reward. • Insensitivity to punishment. • Insensitivity to normal pleasures.
COCAINE[53, 55]	• Weakened connections between the frontal lobe and limbic system (frontostriatal) connections, brain atrophy, and changes in limbic (emotional) and Hippocampus (memory system).	Memory Executive Functioning: • Sensitivity to short-term rewards. • Insensitivity to normal pleasures. • Increased sensitivity to pain.
OPIOIDS[56]	• Weakened connections between the frontal lobe and limbic system (frontostriatal) connections, brain atrophy, and changes in limbic (emotional) and Hippocampus (memory system).	Memory Executive Functioning: • Sensitivity to short-term rewards. • Insensitivity to normal pleasures. • Increased sensitivity to pain.

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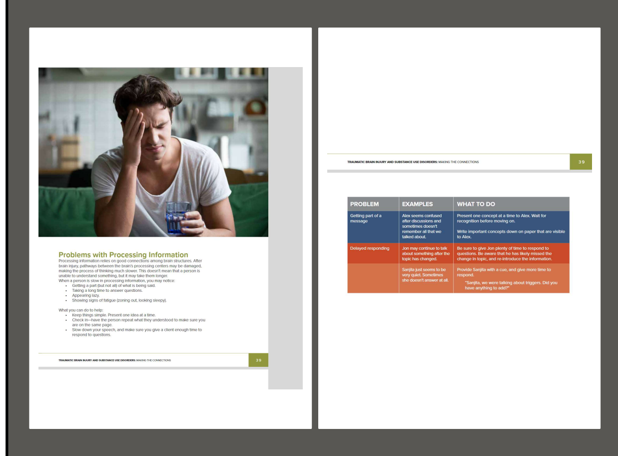

PROBLEM	EXAMPLES	WHAT TO DO
Getting part of a message	Alex seems confused after discussions and sometimes doesn't remember all that we talked about.	Present one concept at a time to Alex. Wait for recognition before moving on. Write important concepts down on paper that are visible to Alex.
Delayed responding	Jon may continue to talk about something after the topic has changed.	Be sure to give Jon plenty of time to respond to questions. Be aware that he has likely missed the change in topic, and re-introduce the information.
	Sanjita just seems to be very quiet. Sometimes she doesn't answer at all.	Provide Sanjita with a cue, and give more time to respond. "Sanjita, we were talking about triggers. Did you have anything to add?"

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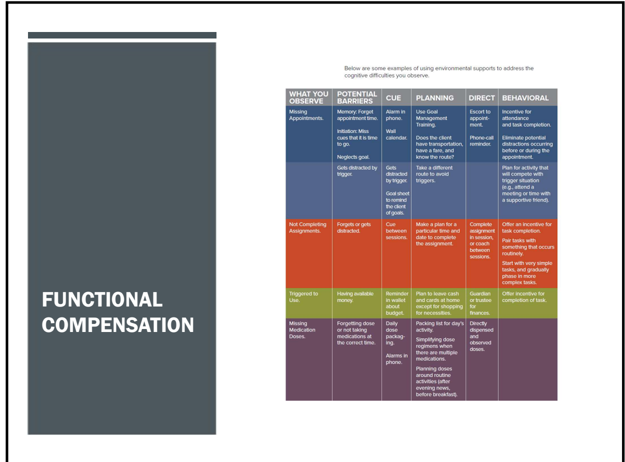

WHAT YOU OBSERVE	POTENTIAL BARRIERS	CUE	PLANNING	DIRECT	BEHAVIORAL
Missing Appointments.	Memory: Forget appointment time. Initiation: Miss cues that it is time to go. Neglects goal.	Alarm in phone. Wall calendar.	Use Goal Management Training. Does the client have transportation, have a fare, and know the route?	Escort to appoint-ment. Phone-call reminder.	Incentive for attendance and task completion. Eliminate potential distractions occurring before or during the appointment.
	Gets distracted by trigger.	Gets distracted by trigger. Goal sheet to remind the client of goals.	Take a different route to avoid triggers.		Plan for activity that will compete with trigger situation (e.g., attend a meeting or time with a supportive friend).
Not Completing Assignments.	Forgets or gets distracted.	Cue between sessions.	Make a plan for a particular time and date to complete the assignment.	Complete assignment in session, or coach between sessions.	Offer an incentive for task completion. Pair tasks with something that occurs routinely. Start with very simple tasks, and gradually phase in more complex tasks.
Triggered to Use.	Having available money.	Reminder in wallet about budget.	Plan to leave cash and cards at home except for shopping for necessities.	Guardian or trustee for finances.	Offer incentive for completion of task.
Missing Medication Doses.	Forgetting dose or not taking medications at the correct time.	Daily dose packag-ing. Alarms in phone.	Packing list for day's activity. Simplifying dose regimens when there are multiple medications. Planning doses around routine activities (after evening news, before breakfast).	Directly dispensed and observed doses.	

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	ALERTNESS/ FATIGUE	ATTENTION	PROCESSING	MEMORY	EXECUTIVE COMMUNICATION BEHAVIOR
Observations	Sleepy in appointments after 2 p.m. Often arrives hungry.	Changes topic, distracted by noise.	Gets only part of the message.	Needs reminders for appt. and tasks.	Dominates in groups. Often makes off-color jokes.

GOAL AREA	SUPPORTIVE STRATEGIES
Attendance and participation	Review how to make reminders in phone (set alarm for one hour before appointments). Schedule for morning appointments.
Attention and comprehension	Use notes in session as cue for topic. Take picture for reminder. Slow down/ break down messages.
Learning and remembering new information	Picture of session notes. Review previous session at start of session. Organize information into top two or three things to remember. Repeat key messages.
Following through with tasks	Make specific plans, and help to create reminders in phone or as notes/ posters at home. Break tasks down into small elements. Encourage client to enlist help of family to support follow-up.
Understanding strengths and needs	Use goal setting. Ask client to predict behavior/track progress. Review events, and modify approach as needed.
Setting realistic goals	Encourage client to dream big and start small with a goal that can be done in the next week. Build on most recent success.

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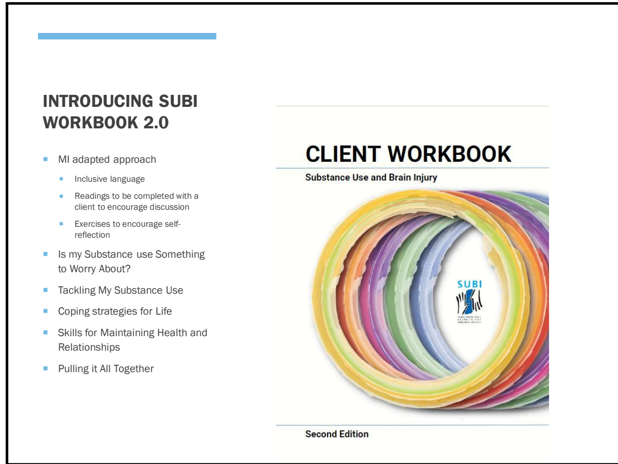

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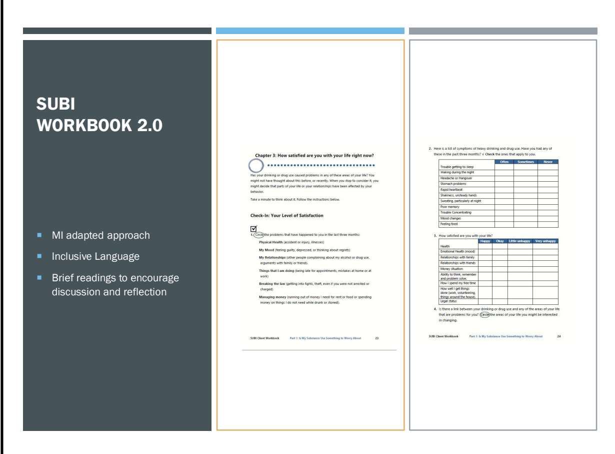

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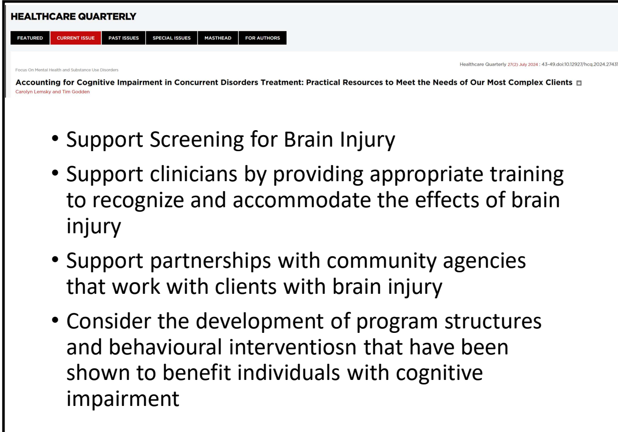

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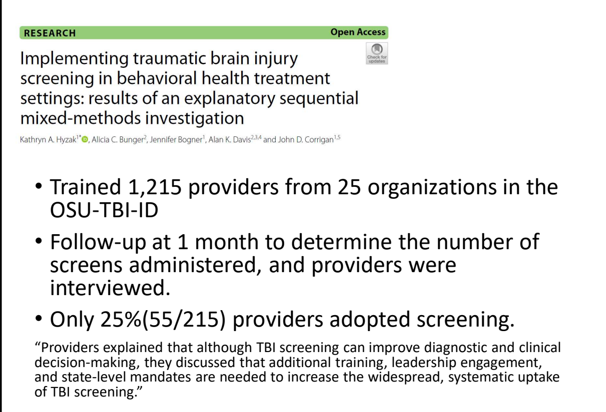

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RESEARCH Open Access

Implementing traumatic brain injury screening in behavioral health treatment settings: results of an explanatory sequential mixed-methods investigation

Kathryn A. Hyzak[1*], Alicia C. Bunger[2], Jennifer Bogner[1], Alan K. Davis[2,3,4] and John D. Corrigan[1,5]

"Providers explained that although TBI screening can improve diagnostic and clinical decision-making, they discussed that additional training, leadership engagement, and state-level mandates are needed to increase the widespread, systematic uptake of TBI screening."

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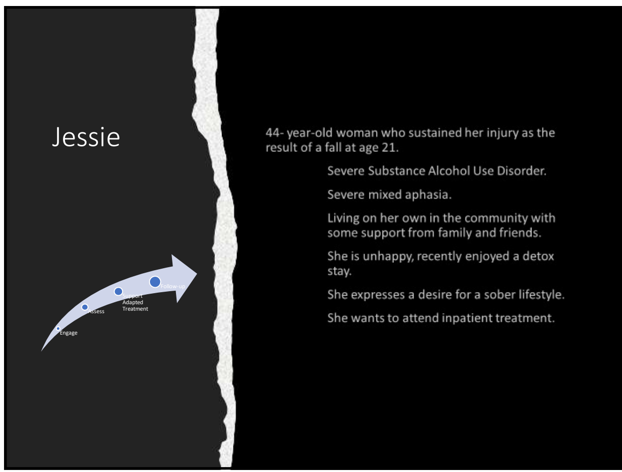

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Jessie

Prepare client and providers for inpatient stay

- Augmentative Communication Strategies
- Staff Training
- Direct support while in programming.

Look for long-term supports in the community

- CHIRS outreach programming
- Sober living settings
- Education for natural supports

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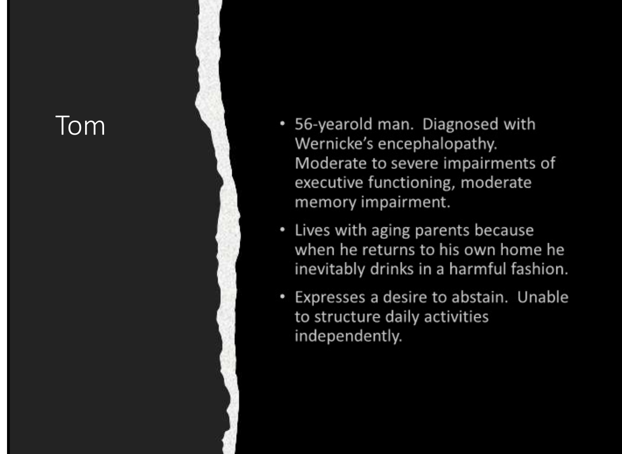

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Tom

- Social Support
  - Men's group
  - Outreach Supports to coordinate with addictions programming
  - Education and support for Addictions program
  - Meaningful activity
- Family education
  - Social Work Intervention
- Support to find culturally relevant supported housing in the community

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Andrew

- History of Childhood adverse events
- 25 year-old who used cannabis regularly since early adolescence.
- Severe brain injury at 15 years. Ongoing Cannabis use.
- Developed Psychotic Disorder beginning at age 19.
- Failed housing placements as the result of verbally aggressive behaviour.
- Unhoused. Refuses treatment for psychotic disorder.
- Despite a community treatment order he has been lost to care for 4 months.

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Andrew

Partnership with ACTT

- Supported compliance with depot medication

Active support while housed in the shelter system

- Communication with shelter staff
- Development of coordinated approaches to difficult behaviour

Ongoing communication with family

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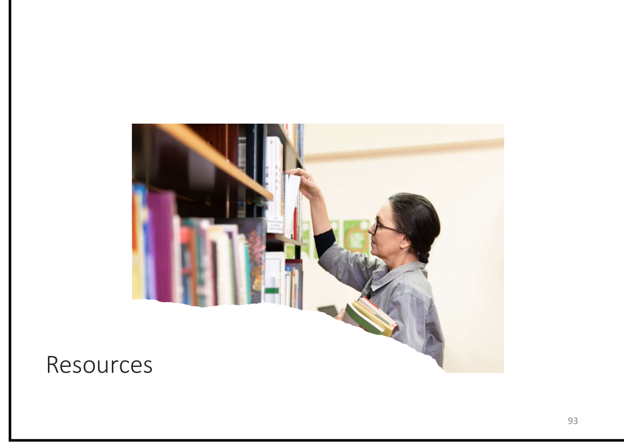

Resources

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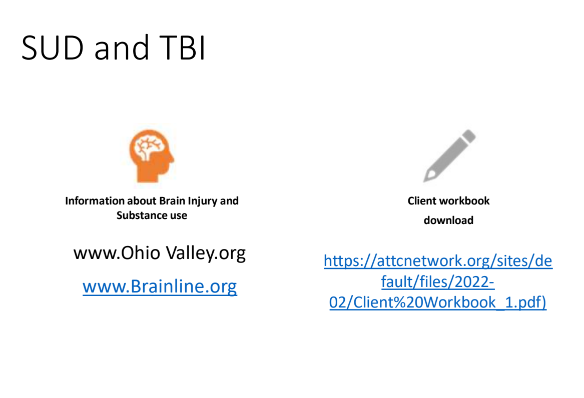

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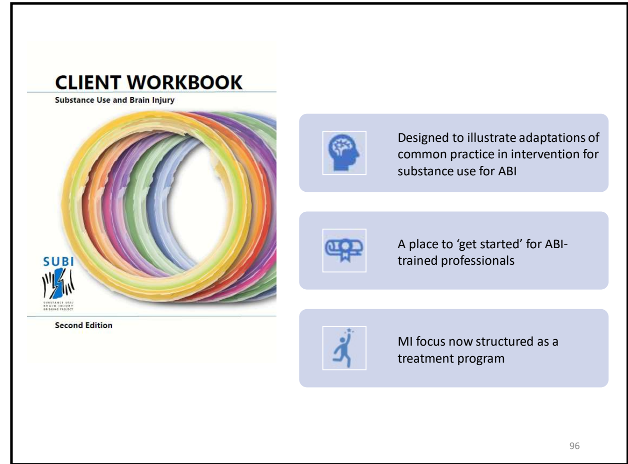

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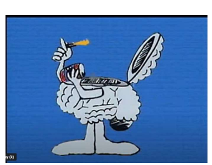
Multi-media



OLD VIDEO
https://www.youtube.com/watch?v=6RubUo3urpA&t=133s

https://www.youtube.com/watch?v=Rmu3fPhxaGs

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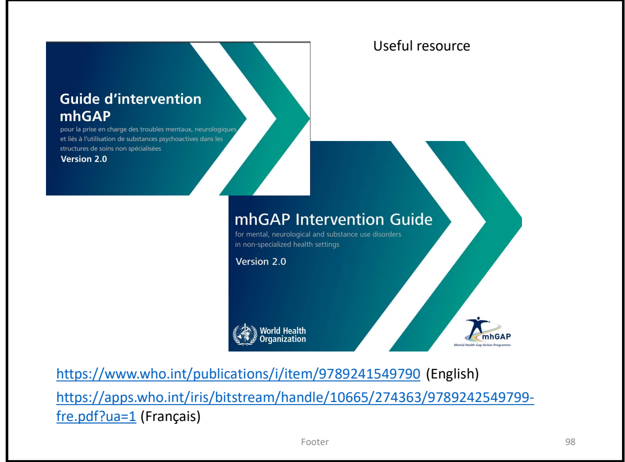
Useful resource



https://www.who.int/publications/i/item/9789241549790 (English)
https://apps.who.int/iris/bitstream/handle/10665/274363/9789242549799-fre.pdf?ua=1 (Français)

Footer 98

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Craft / CRA

The Community Reinforcement Approach
An Update of the Evidence
Robert J. Meyers, Ph.D., Hendrik G. Roozen, Ph.D., and Jane Ellen Smith, Ph.D
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3860533/

Community Reinforcement Approach
https://www.ccsa.ca/community-reinforcement-approach-essentials-series

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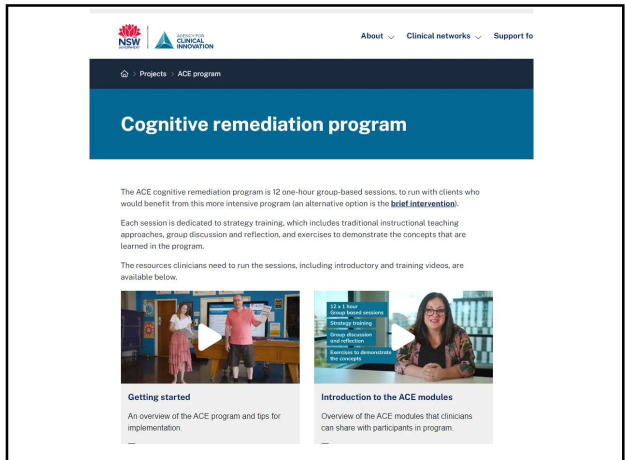

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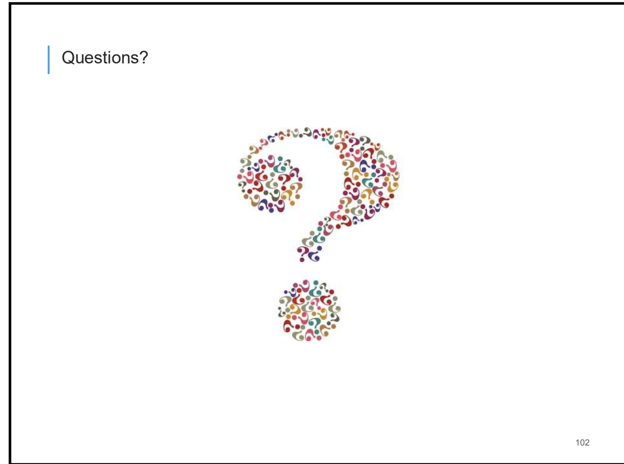

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