Brain injury after non-fatal overdose: A rising concern

Lésions cérébrales après une surdose non mortelle : une préoccupation croissante

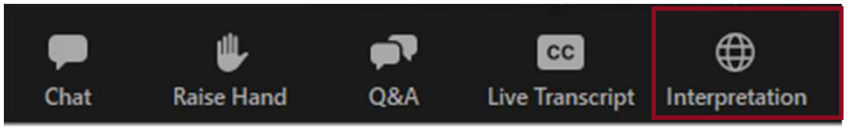
March 20, 2025 / 20 mars 2025

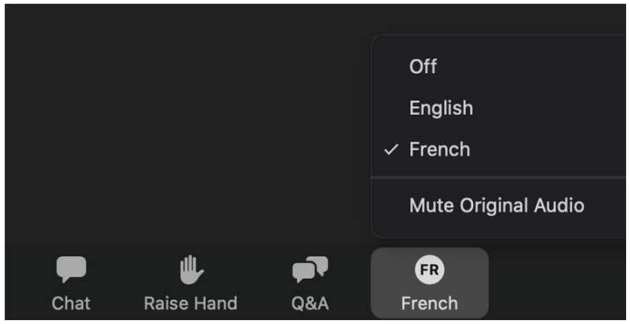
CATIE

Interpretation / Interprétation

English-French simultaneous interpretation is available during the webinar.

Attendees should choose their preferred language from the **Interpretation** tab at the bottom of the screen.





Durant le webinaire, des services d'interprétation simultanée anglais-français sont disponibles.

Les participant·e·s au webinaire devront opter pour la langue de leur choix à partir de l'onglet **Interprétation** au bas de l'écran.

Agenda

i. **Welcome and introduction** (5 min)
ii. **Panelist presentations** (20 min)
iii. **Frontline perspectives** (10 min)
iv. **Panel discussion** (15 min)
v. **Q&A, closing** (10 min)

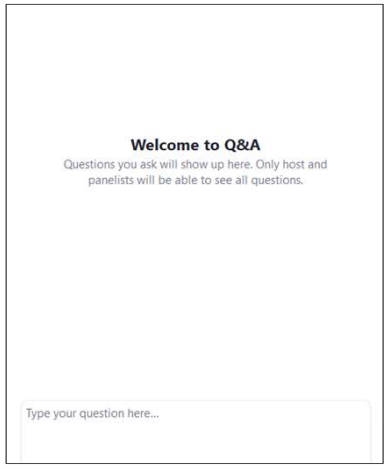
Ordre du jour

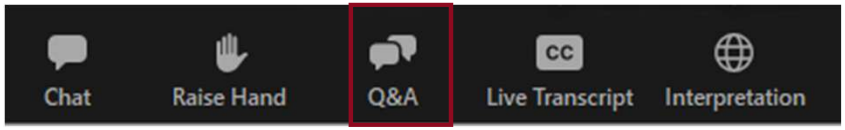
i. **Mot de bienvenue et présentations** (5 minutes)
ii. **Présentations par les panélistes** (20 minutes)
iii. **Perspectives des premières lignes** (10 minutes)
iv. **Table ronde** (15 minutes)
v. **Séance de questions et réponses, et mot de la fin** (10 minutes)

Panelists / Panélistes

- **Mauricio Garcia-Barrera,** University of Victoria/Université de Victoria
- **Chloé Xavier,** BC Centre for Disease Control
- **Garam Kim,** BC Ministry of Health/ministère de la Santé de la C.-B
- **Marliss Taylor,** Streetworks

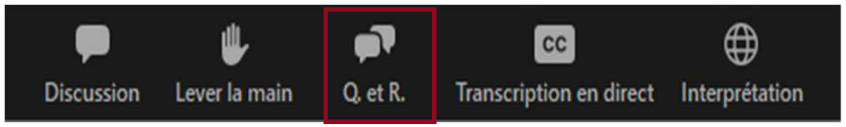
Q&A / Q. et R.





All attendees will be muted during the webinar.

Submit your questions in English or French through the **Q&A** tab at the bottom of the screen (not the Chat tab).



Tou·te·s les participant·e·s resteront en sourdine durant le webinaire.

Posez vos questions en français ou en anglais par l'intermédiaire de l'onglet **Q. et R.** au bas de l'écran (non celui de Converser).

CATIE
Canada's source for HIV and hepatitis C information

Brain injury after non-fatal overdose: A rising concern

Mauricio Garcia-Barrera

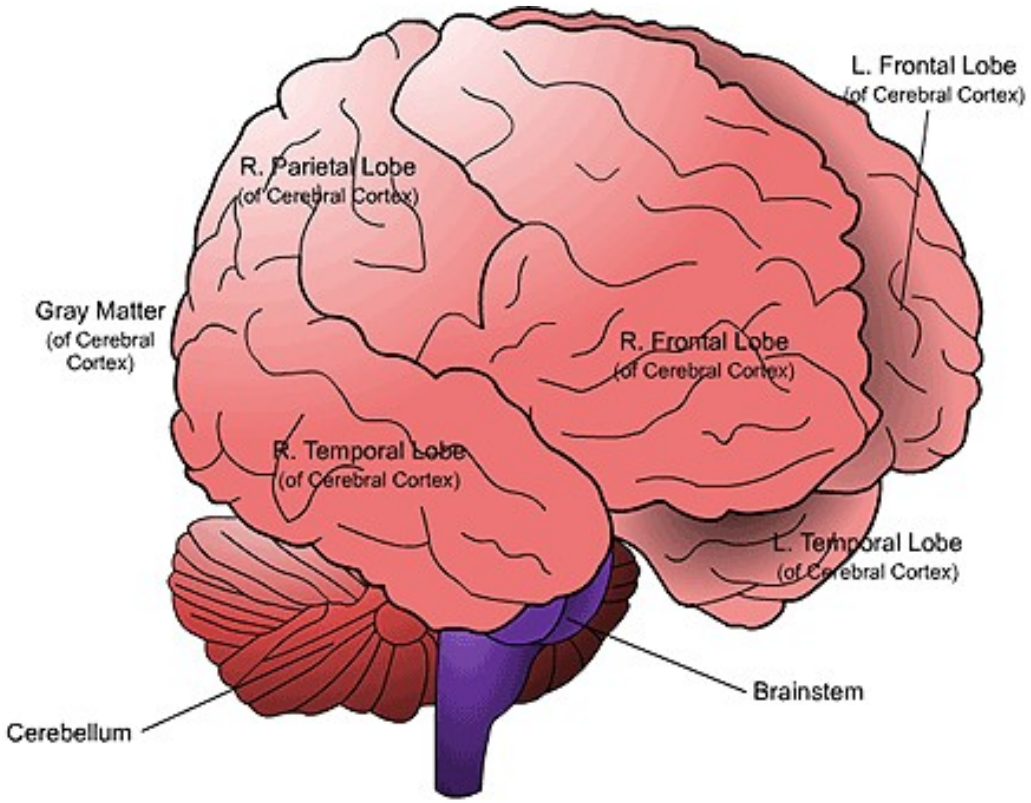
University of Victoria

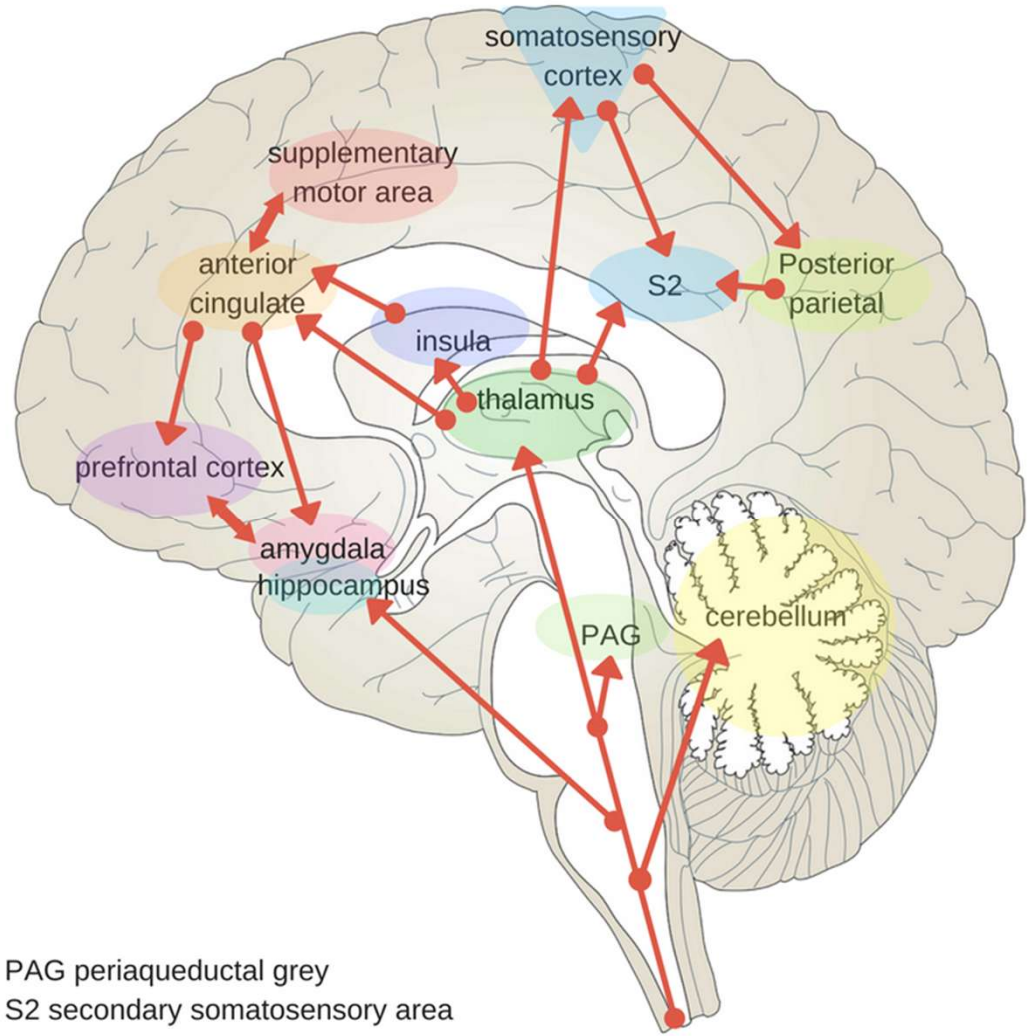
University of Victoria

BC CONSENSUS ON BRAIN INJURY
HEADS TOGETHER THINK TANK

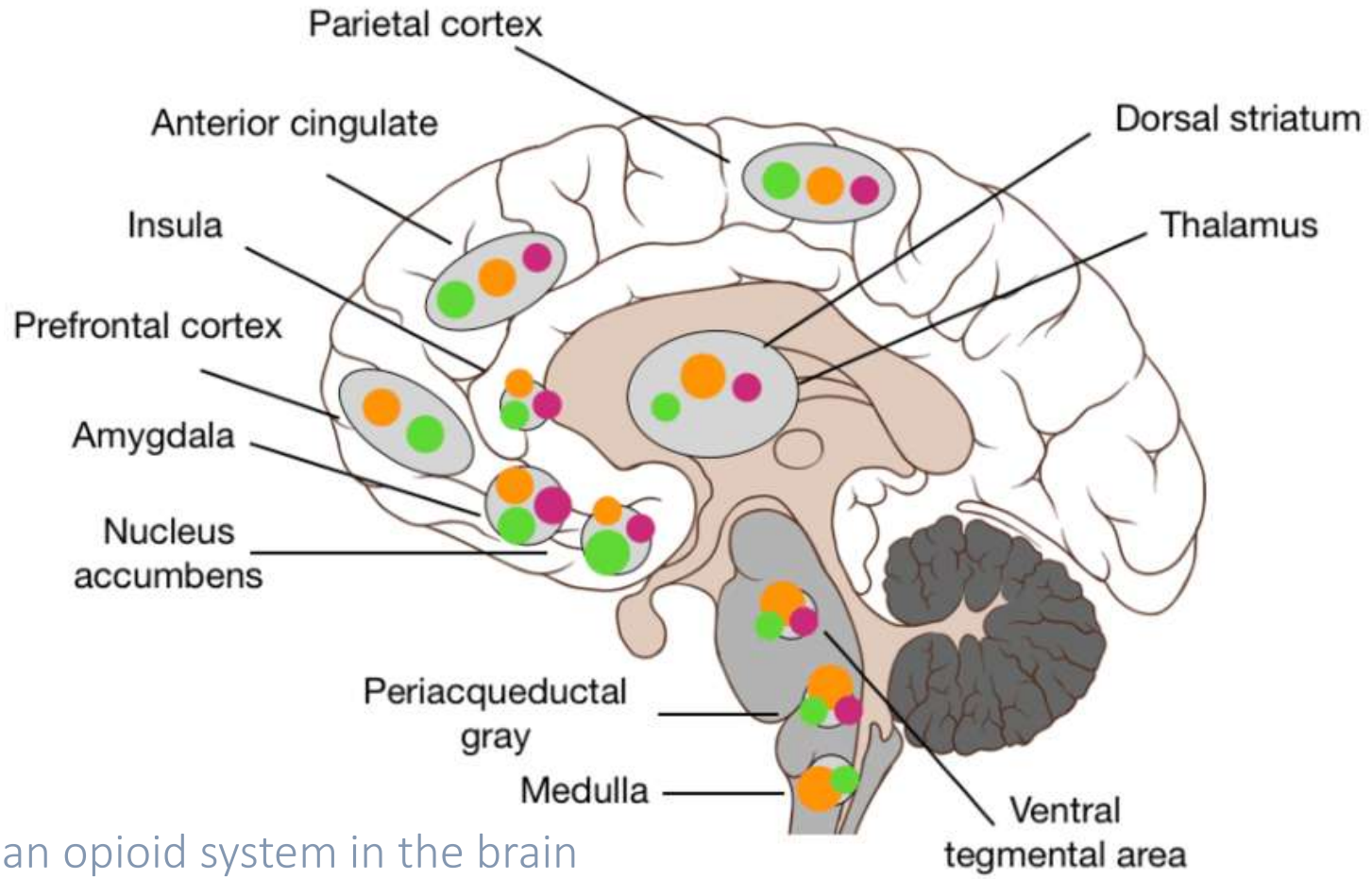
CORTEX
A RESEARCH LAB FOR THE STUDY OF EXECUTIVE FUNCTIONS

1 MINUTE NEUROANATOMY PRIMER





https://www.brightbraincentre.co.uk/chronic-pain-brain/



Organization of the human opioid system in the brain

L Nummenmaa, K Seppälä, V Putkinen
Social and Affective Neuroscience of Everyday Human Interaction, 2020

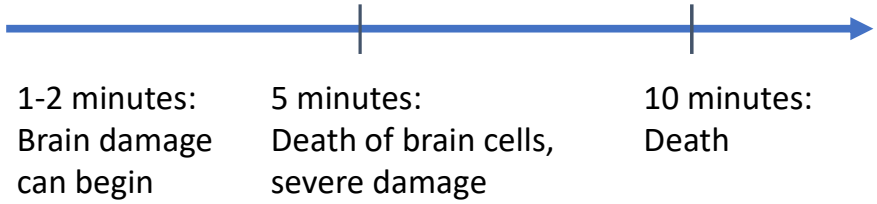
DRUG POISONING AND BRAIN INJURY

Opioid-induced respiratory depression:

Breathing disorder characterized by shallow or ineffective breathing

Synthetic drugs target the Central Nervous System, particularly the brainstem which controls breathing

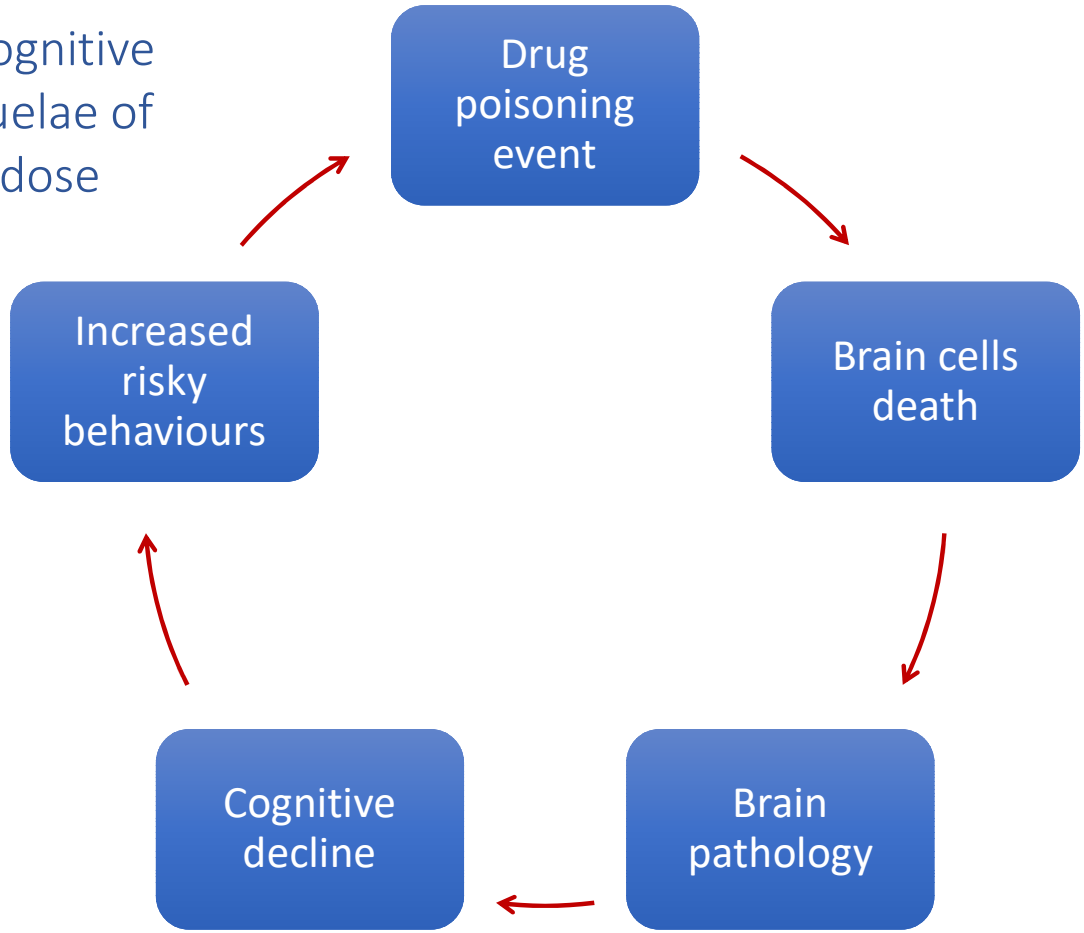
Total brain oxygen deprivation timeline:



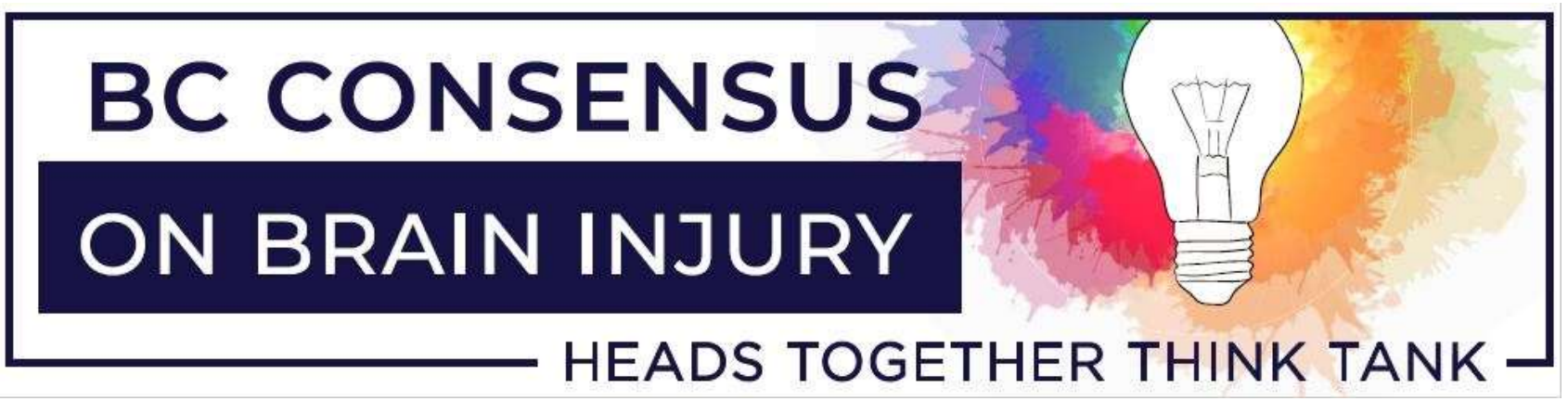
OVERDOSE AFTERMATH: NEUROCOGNITIVE IMPAIRMENTS

Brain area affected	Cognitive/behavioral effect
Hippocampus	Memory problems (amnesia)
Cerebellum	Motor incoordination
Basal ganglia	Motor control problems
Fronto-parietal circuits	Problems with attention
Prefrontal cortex	Executive problems
Limbic systems	Emotional/psychiatric symptoms

A vicious cycle of neuropathological, cognitive and behavioural sequelae of repeated opioid overdose



Voronkov et al., 2021 https://doi.org/10.1016/j.drugpo.2021.103362


BC CONSENSUS
ON BRAIN INJURY
HEADS TOGETHER THINK TANK

BRITISH COLUMBIA | Ministry of Mental Health and Addictions

BC CONSENSUS ON BRAIN INJURY
HEADS TOGETHER THINK TANK

vancouver foundation

"BC Consensus on Brain Injury is a three-year research project aimed at reaching a consensus on the priorities needed to best serve people experiencing the intersections of brain injury, mental health, and addictions in British Columbia"

For more, visit: www.bcconsensusonbraininjury.com

University of Victoria

CGB Centre FOR TRAUMATIC LIFE LOSSES

UBC THE UNIVERSITY OF BRITISH COLUMBIA

PI/Community partner

Janelle Breese Biagioni, RPC, MPCC-S

CEO & Founder
CGB Centre for Traumatic Life Losses

Co-PI/Research Lead

Mauricio A. Garcia-Barrera, Ph.D., R.Psych.

Associate Dean - Research & Graduate Studies
Faculty of Social Sciences
Professor
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Co-Investigator

Julia Schmidt, PhD, BSc(OT)

Assistant Professor, Department of Occupational Science and Occupational Therapy,
Faculty of Medicine
University of British Columbia

Co-Investigator

Erica Woodin, Ph.D., R.Psych.

Professor
Department of Psychology
University of Victoria

CGB Centre
FOR TRAUMATIC LIFE LOSSES

THE UNIVERSITY OF BRITISH COLUMBIA

University of Victoria

Cole Kennedy

Graduate Student
Clinical Psychology Program, Neuropsychology
Department of Psychology, University of Victoria
CORTEX Lab

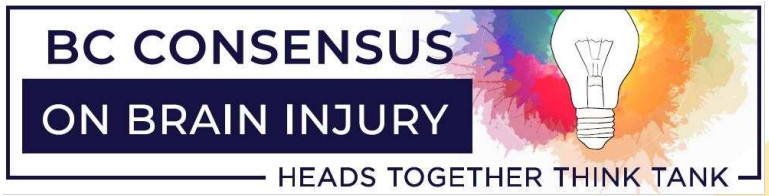
Graduate Research Lead

Consensus Days

PARTICIPATORY-ACTION RESEARCH:

Exploring the Intersections between Mental Health, Addictions, and Brain Injury

A three-year consensus programming



October 14, 2022

106 participants

Year One

- Overdose-related Hypoxic Brain Injury

June 22, 2023

146 participants

Year Two

- Intimate Partner Violence and Brain Injury

June 20, 2024

163 participants

Year Three

- Insecure Housing, Homelessness and Brain Injury

Round table activity set up


Themes
Awareness & Education
Individualized care & 1:1 support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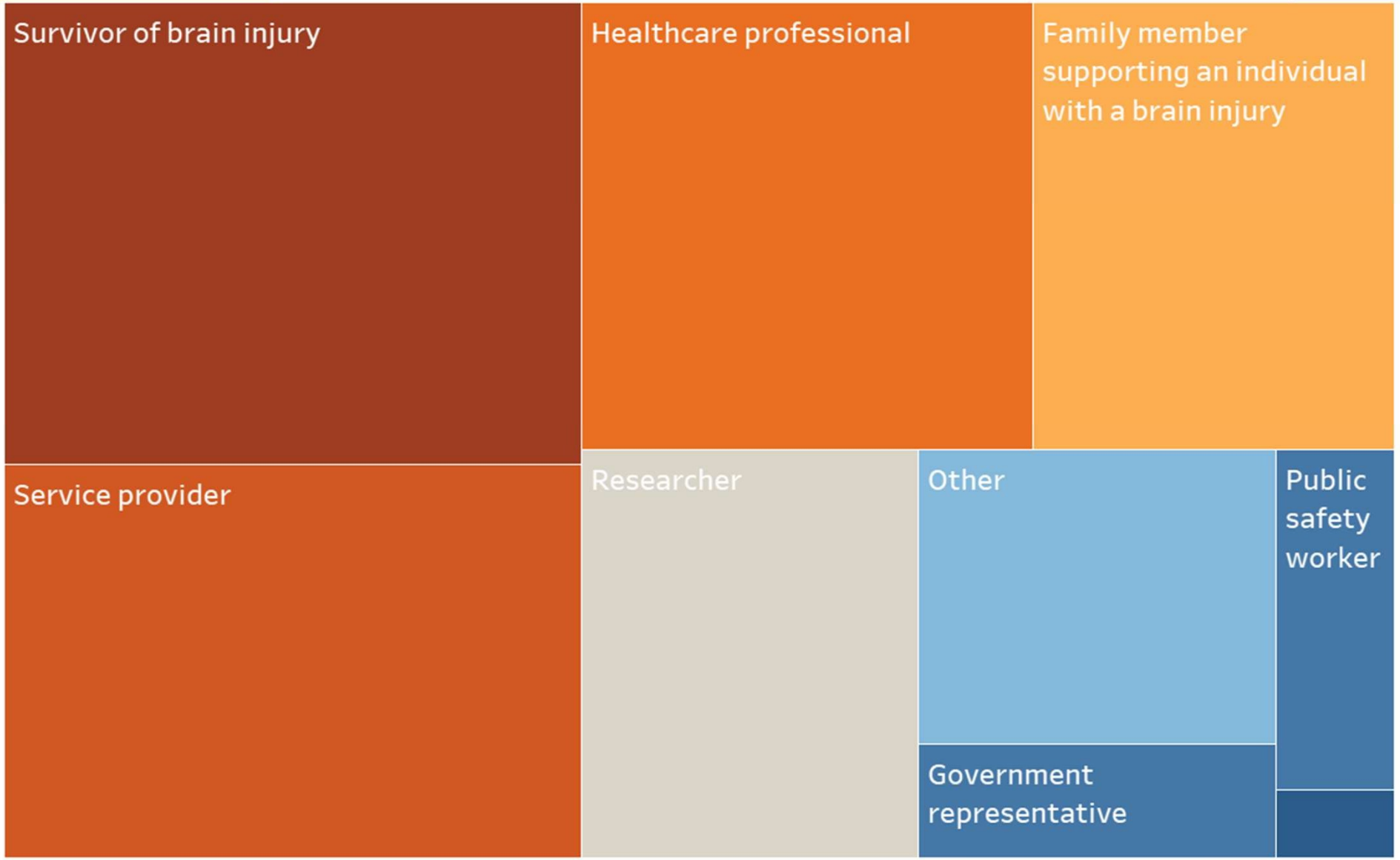
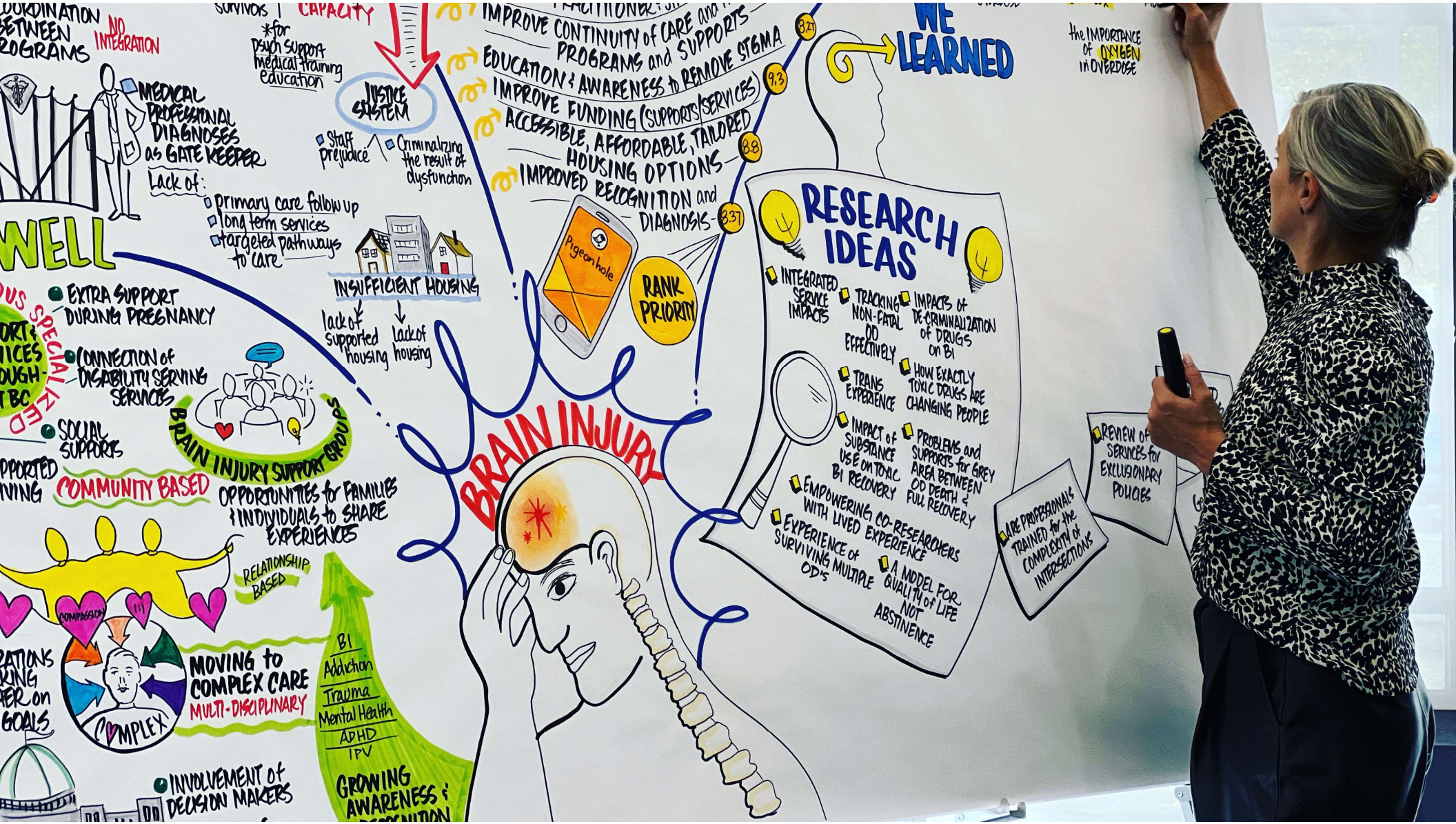
University of Victoria


Survivor of brain injury
Healthcare professional
Family member supporting an individual with a brain injury
Service provider
Researcher
Other
Public safety worker
Government representative


BRAIN INJURY
WELL
MEDICAL PROFESSIONAL DIAGNOSES as GATE KEEPER
Lack of:
primary care follow up
long term services
targeted pathways to care
JUSTICE SYSTEM
Staff prejudice
Criminalizing the result of dysfunction
INSUFFICIENT HOUSING
lack of supported housing
Lack of housing
IMPROVE CONTINUITY of CARE and PROGRAMS and SUPPORTS
EDUCATION & AWARENESS to REMOVE STIGMA
IMPROVE FUNDING (SUPPORTS/SERVICES)
ACCESSIBLE, AFFORDABLE, TAILORED HOUSING OPTIONS
IMPROVED RECOGNITION and DIAGNOSIS
8.21
9.3
8.8
8.37
Pigeon hole
RANK PRIORITY
WE LEARNED
the IMPORTANCE of OXYGEN in OVERDOSE
RESEARCH IDEAS
INTEGRATED SERVICE IMPACTS
TRACKING NON-FATAL OD EFFECTIVELY
IMPACTS of DE-CRIMINALIZATION of DRUGS on BI
TRANS EXPERIENCE
HOW EXACTLY TOXIC DRUGS ARE CHANGING PEOPLE
IMPACT of SUBSTANCE USE on TOXIC BI RECOVERY
PROBLEMS and SUPPORTS for GREY AREA BETWEEN OD DEATH & FULL RECOVERY
EMPOWERING CO-RESEARCHERS WITH LIVED EXPERIENCE
EXPERIENCE of SURVIVING MULTIPLE OD's
A MODEL FOR QUALITY of LIFE NOT ABSTINENCE
ARE PROFESSIONALS TRAINED for the COMPLEXITY of INTERSECTIONS
REVIEW of SERVICES for EXCLUSIONARY POLICIES
EXTRA SUPPORT DURING PREGNANCY
CONNECTION of DISABILITY SERVING SERVICES
SOCIAL SUPPORTS
COMMUNITY BASED
BRAIN INJURY SUPPORT GROUPS
OPPORTUNITIES for FAMILIES & INDIVIDUALS to SHARE EXPERIENCES
RELATIONSHIP BASED
COMPASSION
1:1
COMPLEX
MOVING to COMPLEX CARE
MULTI-DISCIPLINARY
INVOLVEMENT of DECISION MAKERS
BI
Addiction
Trauma
Mental Health
ADHD
IPV
GROWING AWARENESS &
NO INTEGRATION
CAPACITY
*for psych support medical training education

Key Outcomes

BC CONSENSUS ON BRAIN INJURY
HEADS TOGETHER THINK TANK

ACCOMPLISHMENTS

Identification of the main themes associated with the intersections of brain injury, mental health and addictions in our community

Articulation of a research mandate built in collaboration between the stakeholders and the researchers

Increased public awareness on these intersections, as well as education and training opportunities.

NEXT STEPS

Development of a consensus statement on the community priorities

Generation of guidelines and recommendations for the province of British Columbia on the management of brain injury in conjunction with mental health and addictions.

An Emerging Consensus

Some synergies are emerging from Consensus Days:

- The need to provide **better integrated care**, in which access to services and supports is facilitated by servicing co-morbidities within a single and continued process.
- The need for **an adequate screening** for brain injury, mental health, and addictions, that is supported by a collaborative approach to care across health professionals.
- The increasing awareness of the **need for education about brain injury** across health professionals, members of the legal and police system, and many other professionals and volunteers servicing survivors of brain injury.
- **Access to long-term care facilitated by adequate and secure housing** has also emerged as a crucial potential catalyzer of systemic change.
- That the ability to increase access to services, improve existing services, create personalized care, and increase research requires **increased and continuous funding and resourcing from government**, as well as federal policy to support long-term impact of these efforts.

Grewal *et al. BMC Health Services Research* (2024) 24:881
https://doi.org/10.1186/s12913-024-11316-1

BMC Health Services Research

RESEARCH Open Access

Understanding the barriers and facilitators of healthcare services for brain injury and concurrent mental health and substance use issues: a qualitative study

Jasleen Grewal[1,2], Cole J. Kennedy[3,4], Rinni Mamman[1,2], Janelle Breese Biagioni[5], Mauricio A. Garcia-Barrera[3,4] and Julia Schmidt[1,2,6*]

Health Expectations

WILEY

ORIGINAL ARTICLE OPEN ACCESS

Ten Priorities for Research Addressing the Intersections of Brain Injury, Mental Health and Addictions: A Stakeholder-Driven Priority-Setting Study

Cole J. Kennedy[1,2,3] | Erica Woodin[1,3,4] | Julia Schmidt[3,5,6] | Janelle Breese Biagioni[3,7] | Mauricio A. Garcia-Barrera[1,2,3]

Community-Generated Recommendations to Improve Healthcare Services for People Experiencing Homelessness and Concurrent Brain Injury, Mental Health and Substance Use Disorders

Participants were **163** stakeholders in the ABI-MHSU and homeless communities (M_{age} = 34 46.40, SD = ±13.80, 72% female)

Kennedy, et al., under review, *BMC Health Services Research*

Available as a pre-print on OSF!

Key learnings to share:

1. Need for increased awareness of opioid-related hypoxic brain injury
2. Increased efforts to reduce stigma
3. Better surveillance systems are needed
4. Emphasis on preventive measures
5. Need to investigate intersectionality

Bill C-277

Thank you!

Brain injury among people who had a drug poisoning event in BC

1) Estimate the prevalence of brain injury among people who had a drug poisoning in BC

2) Examine the association between drug poisoning and brain injury

BC Provincial Overdose Cohort

Paramedic attended drug poisoning events

Pharmacy dispensations

Primary care records

Hospitalizations

Emergency department visits

Diagnosis of mental or physical health conditions

Social assistance

Death records

Visits to community mental health provider

Provincial correctional records

Findings

	Brain injury (N=369)		No brain injury diagnosis (N=823,796)		Total (N=824,165)	
	N	%	N	%	N	%
Drug poisoning event						
Yes	54	14.6%	5,303	0.6%	5,357	0.6%
No	315	85.4%	818,493	99.4%	818,808	99.4%

- **People who experienced drug poisoning events have a higher prevalence of brain injury compared to people who did not experience a drug poisoning event (1.0% vs. less than 0.04%)**
- **After adjusting for sex, age, and mental illness (excluding SUD), people who experienced drug poisoning events were 15.3 times more likely to have a brain injury than people who did not.**
  - In both adjusted and unadjusted models, risk of brain injury was higher in people who were 30 and older, males, and who had been diagnosed with mental disorder.

High prevalence of overdose-associated brain injury in B.C.

Cross-sectional analysis conducted using health data from 20% random sample of B.C. residents

Non-fatal overdoses and long-term substance use can cause non-traumatic acquired brain injury

People who experienced drug toxicity (overdose)

15.3×

increase in brain injury compared to those who did not

The toxic drug supply in B.C. not only contributes to preventable loss of life, it also results in **significant long-term health consequences,** requiring improved screening, outreach & rehabilitation supports

CHÉOS
Centre for Health Evaluation & Outcome Sciences

BC Centre for Disease Control
PROVINCIAL OVERDOSE COHORT

Xavier CG, et al. *Subst Abuse Treat Prev Policy.* Published online July 7, 2023.

Questions?

Please enter any questions for our panelists into the question box.

Des questions?

Si vous avez des questions pour nos panélistes, veuillez les saisir dans la boîte à cet effet.

Thank you!

Please complete the webinar evaluation that will be provided following this webinar.

Merci!

Veuillez nous faire part de vos commentaires en répondant à l'évaluation qui vous sera envoyée après le webinaire.

Articles mentioned during the webinar

Beyond the tip of the iceberg: Brain injury after drug poisoning https://blog.catie.ca/2024/08/26/beyond-the-tip-of-the-iceberg-brain-injury-after-drug-poisoning/ Une partie cachée de l'iceberg : lésions cérébrales survenant après une intoxication par les drogues https://blog.catie.ca/2024/08/26/une-partie-cachee-de-liceberg-lesions-cerebrales-survenant-apres-une-intoxication-par-les-drogues/?lang=fr
Beyond the tip of the iceberg: Brain injury after drug poisoning https://blog.catie.ca/2024/08/26/beyond-the-tip-of-the-iceberg-brain-injury-after-drug-poisoning/ Une partie cachée de l'iceberg : lésions cérébrales survenant après une intoxication par les drogues https://blog.catie.ca/2024/08/26/une-partie-cachee-de-liceberg-lesions-cerebrales-survenant-apres-une-intoxication-par-les-drogues/?lang=fr
Researchers examine links between drug toxicity and brain injury in British Columbia: https://www.catie.ca/catie-news/researchers-examine-links-between-drug-toxicity-and-brain-injury-in-british-columbia Une équipe britanno-colombienne examine les liens entre la toxicité des drogues et les lésions cérébrales: https://www.catie.ca/fr/nouvelles-catie/une-equipe-britanno-colombienne-examine-les-liens-entre-la-toxicite-des-drogues-et
Understanding the barriers and facilitators of healthcare services for brain injury and concurrent mental health and substance use issues: a qualitative study https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-024-11316-1
Ten Priorities for Research Addressing the Intersections of Brain Injury, Mental Health and Addictions: A Stakeholder-Driven Priority-Setting Study https://pmc.ncbi.nlm.nih.gov/articles/PMC11238575/pdf/HEX-27-e14136.pdf
Community Generated Recommendations to Improve Healthcare Services for People Experiencing Homelessness and Concurrent Brain Injury, Mental Health and Substance Use Disorder (Preprint) https://osf.io/preprints/osf/9eruw_v1
Brain injury after overdose is a hidden epidemic: Recognizing and treating the survivors of the toxic drug crisis https://theconversation.com/brain-injury-after-overdose-is-a-hidden-epidemic-recognizing-and-treating-the-survivors-of-the-toxic-drug-crisis-224602
Association between toxic drug events and encephalopathy in British Columbia, Canada: a cross-sectional analysis https://substanceabusepolicy.biomedcentral.com/articles/10.1186/s13011-023-00544-z