



What does it take to care for a person after a Traumatic Brain Injury? The essential role of Primary Care

Thursday, Oct 5, 2023, 12-1pm

Dr. Mark Bayley
Judith Gargaro

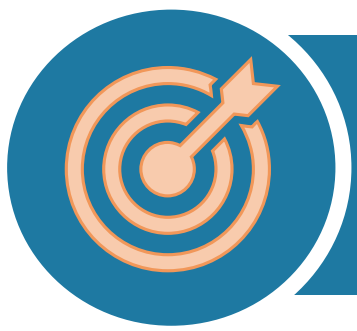
Research Analysts: **Aishwarya Nair, Parwana Akbari**

Land Acknowledgement

We acknowledge that we are on the traditional territory of many Indigenous nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. Today, the meeting place of Toronto is still the home to many Indigenous peoples from across Turtle Island and we are grateful to have the opportunity to work and learn on this territory.

In this Land Acknowledgment, we recognize and respect Indigenous Peoples as traditional stewards of this land and the enduring relationship that exists between Indigenous Peoples and their traditional territories. We recognize the importance of reflecting on what occurred in the past as an important step to reconciliation with our Indigenous communities and other communities that have experienced hardship as part of our colonial past.

We also recognize the challenges and discrimination that can exist in the healthcare system towards persons with Indigenous Background. As system planners, it is our responsibility to identify and implement mechanisms to provide equitable and culturally sensitive care.

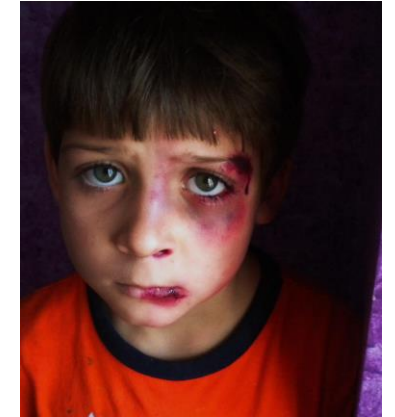


PRESENTATION OBJECTIVES

Key objectives for this presentation are to:

1. Understand the purpose of a Care Pathway and Clinical Practice Guideline (CPG)
2. Discuss the Guideline's updated recommendations and resources and how they relate to the Care Pathway.
3. Explore navigation and application of Pathways and CPG using case examples.

If you or a family member sustains a brain or spinal cord injury, the best possible care may **NOT** be at your local hospital or rehab center...



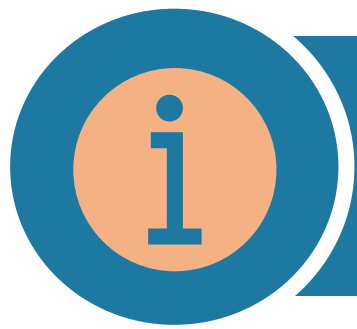
Neurotrauma requires specialized acute, rehabilitation and lifelong care

You or your family member will be discharged from formal acute and inpatient rehab care back into the community....

- hopefully back to the community you came from
- hopefully to a setting that suits you and your needs
- hopefully with resources and support for you to continue your rehab and recovery over the rest of your life

All care and supports should be appropriate for who you are as an individual – respecting your background, your values and your preferences





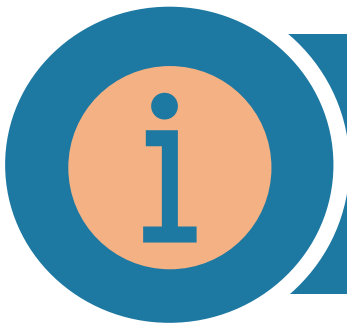
INTRODUCTION



**CANADIAN
CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS
WITH MODERATE TO SEVERE TBI**

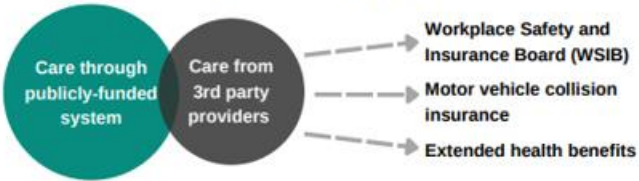
- The Neurotrauma Care Pathways Project is funded by the Ministry of Health to develop evidence-based Ideal Care Pathways for **concussion, moderate-to-severe TBI, and traumatic spinal cord injury**
- Care Pathways organize building blocks of care at each stage of the care continuum, and Clinical Practice Guidelines provides the clinical details
- The living Canadian TBI Guideline was designed to provide evidence-based recommendations for the rehabilitation of adults having sustained a moderate to severe TBI



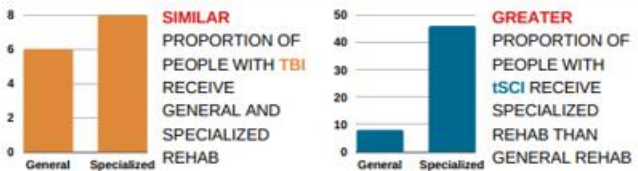
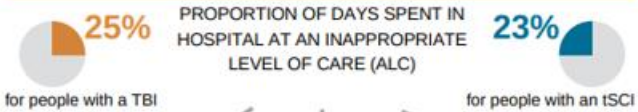
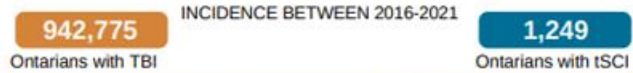


CURRENT STATE EVALUATION

Traumatic brain injury (TBI) and traumatic spinal cord injury (tSCI) occur when there is damage to the brain or spinal cord caused by a traumatic event such as a blow, fall, motor vehicle collision, or sports-related injury.



Living with a TBI and/or tSCI requires lifelong supports and care.



Community-based specialized rehabilitative care is necessary, yet wait times are long, the number of sessions are limited, and indicator data is scarce.



People with access to 3rd party providers have minimal to no wait for services, but may not be seen by a health professional with specialized training in neurotrauma

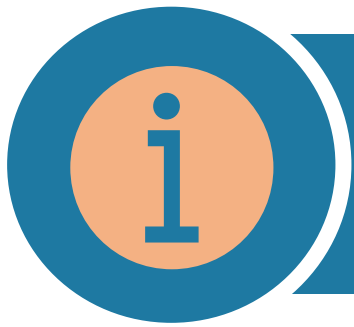
CURRENT OCCUPANCY AND WAITING LISTS FOR ABI SPECIALIZED 24/7 RESIDENCES IN ONTARIO



PROVINCIAL TRAUMATIC BRAIN INJURY (TBI) REPORT CARD

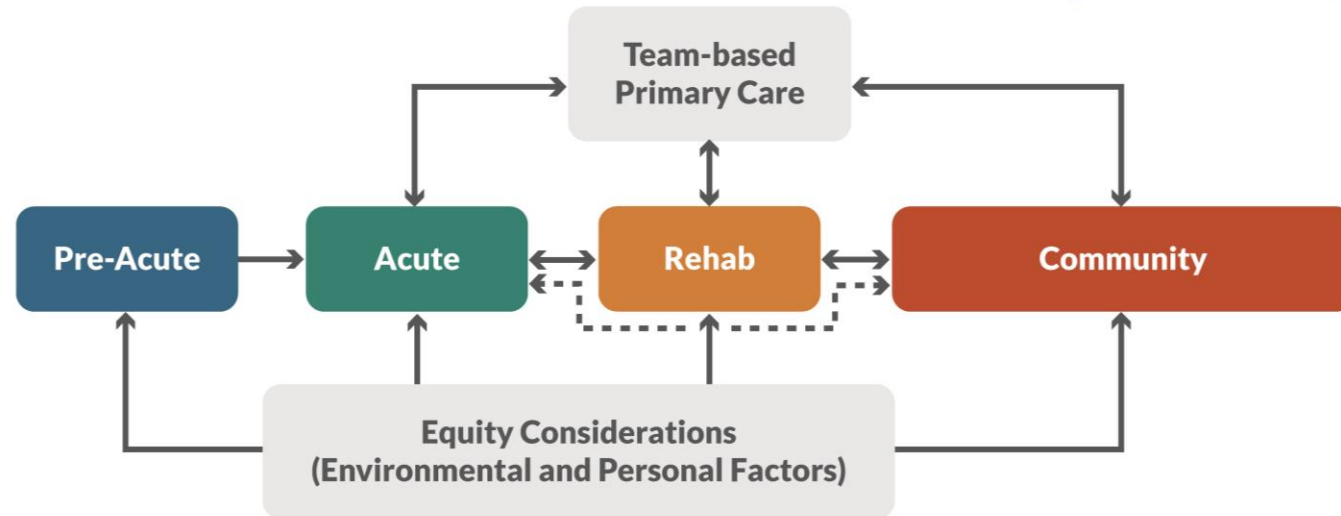
The Provincial TBI Report Card Working Group, formerly an initiative of the Ontario Neurotrauma Foundation, collaborates with IC/ES to produce annual Provincial TBI Report Cards using administrative data. The goal of these Reports is to provide a snapshot of TBI care across the province using evidence-based quality indicators.

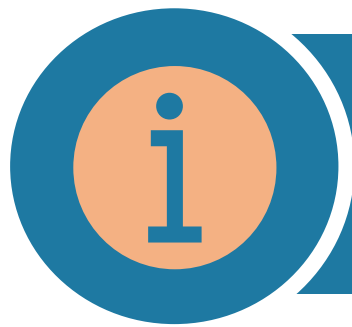
<https://kite-uhn.com/brain-injury/en/prov-tbi-report-card>



NEUROTRAUMA CARE PATHWAYS

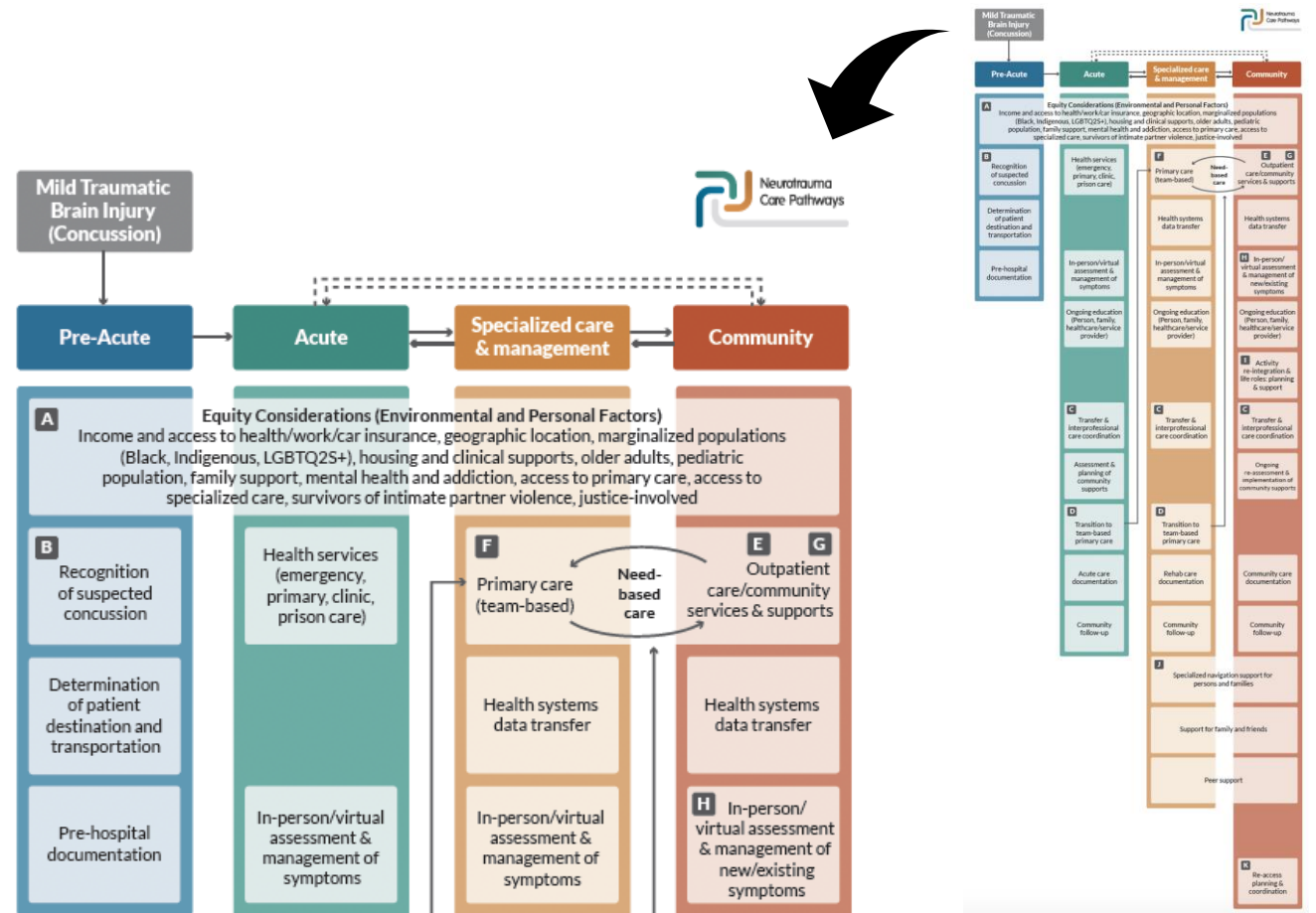
- Over 200 key partners have been engaged; particularly persons with lived experience
- Each care stage contains building blocks (key elements of care), which are linked to existing evidence-based CPGs.

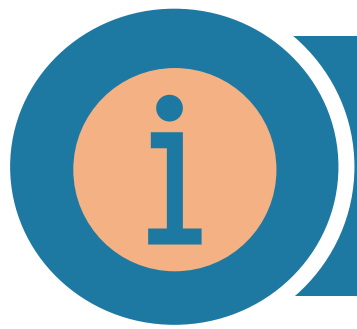




CARE PATHWAYS

The gaps between current and ideal practices can be eliminated through implementation of the building blocks and companion quality indicators by health care providers and system planners.





QUALITY INDICATORS

- Each Ideal Care Pathways building block of care includes
 - the definition and technical specifications of the Quality Indicator to evaluate the care stage
 - the status/feasibility of using the Quality Indicator
- Some building blocks contain multiple Quality Indicators that evaluate different aspects of that stage

Indicator Type	Equity	Pre-Acute	Acute	Rehab	Community	Total
Core set	3	1	7	4	7	22
Must-have	2	0	3	4	8	17
Should-have	3	0	12	3	2	20
Nice-to-have	3	1	2	1	1	8
Total	11	2	24	12	18	67

Acute Data



Ongoing education (Person, family, healthcare/service provider)

Indicator: Proportion of a) patients and b) informal caregivers (e.g., family members) who, while receiving acute care, receive injury-specific education regarding prognosis, treatment options, management, and community supports

- **Status/Feasibility:** To implement in 2025 or beyond. This indicator is currently of low feasibility because there is no province-wide standardized infrastructure to systematically collect this data. Education and resource data in acute care may only be available in physician discharge notes or electronic medical records (EMR), which currently cannot be extracted systematically.

Specialized care & management Data

Primary care (team-based)

Indicator: Proportion of patients with persisting post-concussion symptoms (lasting over 90 days) who are referred from primary care to specialized, interprofessional concussion care within 90 days of injury/first visit

- **Status/Feasibility:** To implement in 2025 or beyond. There is currently no existing infrastructure to collect this type of data systematically and across the province.





CARE PATHWAYS WEBSITE

Neurotrauma Care Pathways Interactive Website:

<https://www.neurotraumapathways.ca>

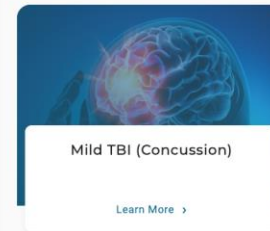


- Home
- About Us >
- Mild TBI (Concussion)
>
- Moderate to Severe TBI
>
- Traumatic SCI >
- Persons With Lived
Experience
Engagement
- Resources >

Welcome to the Neurotrauma Care Pathways
Website

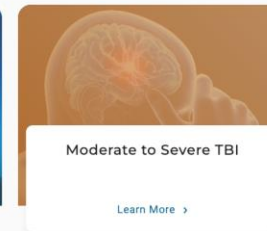


FOR ASSISTANCE WITH WEBSITE NAVIGATION, PLEASE VIEW OUR [WEBSITE MAP](#)



Mild TBI (Concussion)

[Learn More >](#)



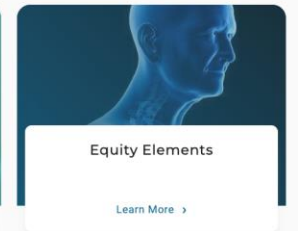
Moderate to Severe TBI

[Learn More >](#)



Traumatic SCI

[Learn More >](#)



Equity Elements

[Learn More >](#)



Ideal Care Pathways



TARGET AUDIENCES

- **Care Pathways:**

- *Primary:* Healthcare providers, clinical managers and system planners who can implement building blocks of care and companion quality indicators to eliminate gaps between current and ideal practices
- *Secondary:* Persons with lived experience and their families/caregivers

- **Clinical Practice Guidelines:**

- *Primary:* Clinicians, primary care providers and family health teams who may not specialize in working with individuals with brain injury, and/or who may not be up to date on current evidence and best care practices for working with patients with brain injury of any severity
- *Secondary:* Persons with lived experience and their families/caregivers



LIVING GUIDELINE UPDATE PROCESS



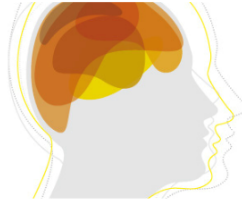
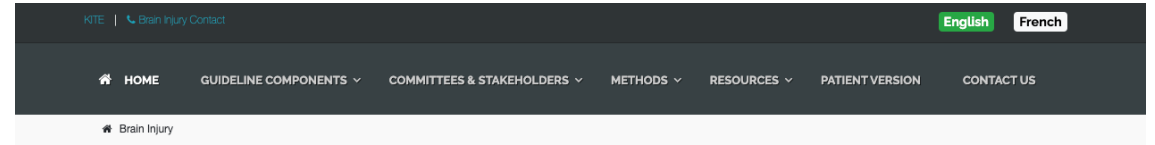
ERABI EVIDENCE-BASED REVIEW
of moderate to severe
ACQUIRED BRAIN INJURY

<https://erabi.ca/>



'LIVING' WEBSITE

The Canadian TBI Guideline Website:
<https://kite-uhn.com/brain-injury/en>



CANADIAN CLINICAL PRACTICE GUIDELINE FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI

Standards for Traumatic Brain Injury

The goal of setting standards of care for people with brain injury is to ensure people have the right care, delivered at the right time, from the right provider. Quality of care can vary across the province, the standards for brain injury care guide the care journey to make sure all Ontarians receive the same...

Provincial TBI Report Card

The Provincial TBI Report Card Working Group, formerly an initiative of the Ontario Neurotrauma Foundation, collaborates with IC/ES to produce annual Provincial TBI Report Cards using administrative data. The goal of these Reports is to provide a snapshot of TBI care across the province using evidence-based quality indicators.

Patient Handbook


This 15-page handbook describes the rehabilitation of adults with moderate to severe traumatic brain injury and includes links to helpful resources for patients and their families. This document is based directly on the clinical practice guideline and was created with input from experts and people with lived experience.





SECTION 1

Section 1 - Components of the Optimal TBI Rehabilitation System

- A - Key Components of TBI Rehabilitation
 - B - Telehealth 
 - C - Subacute Rehabilitation
 - D - Promoting Reintegration and Participation
 - E - Caregivers and Families
 - F - Brain Injury Education and Awareness
 - G - Capacity and Consent
- Target Audience: Health system leaders who are designing systems



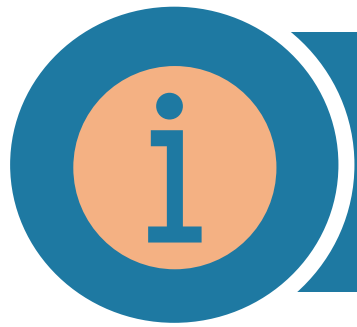
SECTION 2

Section 2 - Assessment and Rehabilitation of Brain Injury Sequelae

- H - Comprehensive Assessment of the Person with TBI
- I - Disorders of Consciousness
- J - Cognitive Functions
- K - Cognitive Communication
- L - Dysphagia and Nutrition
- M - Motor Function and Control
- N - Sensory Impairment
- O - Fatigue and Sleep Disorders
- P - Pain and Headaches
- Q - Psychosocial / Adaptation Issues
- R - Neurobehaviour and Mental Health
- S - Substance Use Disorders
- T - Medical / Nursing Management
- U - Intimacy and Sexuality

NEW
Chapter

➤ Specific strategies targeted at clinicians



TWO TYPES OF RECOMMENDATIONS

➤ **Fundamental Recommendations**

- elements that rehabilitation programs need to have in place to build the rest of the system properly
- primarily for program managers and their leaders as they reflect upon the service conditions for optimal rehabilitation provision.

➤ **Priority Recommendations**

- clinical practices or processes deemed most important to implement and monitor during rehabilitation
- practices most likely to bring on positive outcomes for people with TBI.





OVERVIEW OF RECENT UPDATES

Section 1 - Components of the Optimal TBI Rehabilitation System

- > A - Key Components of TBI Rehabilitation
- > B - Telehealth
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- **New/Updated recommendations, summary of evidence, tools, resources**
- **New chapters: Telehealth (B), Intimacy & Sexuality (U)**

A. Key Components of TBI Rehabilitation

Save PDF

Guidelines Index

- A - Key Components of TBI Rehabilitation
- B - Telehealth
- C - Subacute Rehabilitation
- D - Promoting Reintegration and Participation
- E - Caregivers and Families
- F - Brain Injury Education and Awareness
- G - Capacity and Consent
- H - Comprehensive Assessment of the Person with TBI
- I - Disorders of Consciousness
- J - Cognitive Functions
- K - Cognitive Communication
- L - Dysphagia and Nutrition

Priority Fundamental New Level of Evidence

A.1 - Principles for Organizing Rehabilitation Services

Recommendations

A.1.1 Every individual with a moderate or severe traumatic brain injury (TBI) who experiences brain injury related impairments/functional changes (physical and/or psychological functioning) should receive timely specialized interprofessional rehabilitation services.
(Adapted from INESSS-ONF, 2015)

A.1.2 Rehabilitation interventions should be initiated when the person with TBI is medically stable.
(Adapted from INESSS-ONF, 2015)

NOTE: Post-traumatic amnesia/confusion is not a contraindication to initiating rehabilitation (Trevena-Peters et al., 2018).

Summary of Evidence

Due to the unique challenges and complexity of cognitive behavioural changes associated with traumatic brain injury (TBI), it is suggested that all rehabilitation programs should include the same key components. Components include interprofessional care and early and timely specialized rehabilitation services, standardized protocol for managing challenging/addictive behaviours and cross-training healthcare providers, as well as providing goal-oriented rehabilitation within an integrated and continuous care pathway.

The [Neurotrauma Care Pathway Project](#) developed an evidence-based ideal care pathway for moderate-severe TBI outlining a person's transition through each care system e.g. pre-acute, acute care, rehabilitation, and community services. The development process involved extensive consultation with key partners, including persons with lived experience, and thorough review of current research evidence (e.g., Evidence-Based Review of Moderate to Severe ABI (ERABI) and this Guideline) to identify essential building blocks of care across the lifelong pathway of care. See here for the [moderate-severe TBI care pathway model](#).



WHAT'S NEW?

WHAT'S NEW

June 30, 2023: Review our new sub-sections: [B - Telehealth](#), [U - Intimacy and Sexuality](#)!

June 26, 2023: Access the Neurotrauma Care Pathways website by clicking on the image below!



February 14, 2023: Welcome to the new website for the Canadian Clinical Practice Guideline for Rehabilitation of Adults with Moderate to Severe TBI (formerly the INESSS-ONF Guideline). New evidence-based recommendations, revisions to existing recommendations, and updates to section Rationales, System Implications, Tools and Resources, and Summary of Evidence can be found in the following sub-sections:

- [A - Key Components of TBI Rehabilitation](#) (2 new recommendations, 14 updated recommendations)
- [C - Subacute Rehabilitation](#) (4 new recommendations, 19 updated recommendations)
- [D - Promoting Reintegration and Participation](#) (2 new recommendations, 23 updated recommendations)
- [E - Caregivers and Families](#) (4 updated recommendations)
- [F - Brain Injury Education and Awareness](#) (3 updated recommendations)
- [G - Capacity and Consent](#) (3 updated recommendations)

- [H - Comprehensive Assessment of the Person with TBI](#) (2 new recommendations, 8 updated recommendations)
- [I - Disorders of Consciousness](#) (10 new recommendations, 9 updated recommendations)
- [J - Cognitive Functions](#) (7 new recommendations, 20 updated recommendations)
- [K - Cognitive Communication](#) (3 new recommendations, 6 updated recommendations)
- [L - Dysphagia and Nutrition](#) (4 updated recommendations)
- [M - Motor Function and Control](#) (5 updated recommendations)
- [N - Sensory Impairment](#) (2 updated recommendations)
- [O - Fatigue and Sleep Disorders](#) (3 new recommendations, 2 updated recommendations)
- [P - Pain and Headaches](#) (17 new recommendations, 2 updated recommendations)
- [Q - Psychosocial / Adaptation Issues](#) (2 updated recommendations)
- [R - Neurobehaviour and Mental Health](#) (5 new recommendations, 24 updated recommendations)
- [S - Substance Use Disorders](#) (4 updated recommendations)
- [T - Medical / Nursing Management](#) (6 new recommendations, 1 updated recommendations)

Look out for the 'Open Access INCOG 2.0 Guidelines Series' under Tools & Resources in [sub-sections J](#) and [K](#)!

February 14, 2023: [Inclusion, Diversity, Equity, and Accessibility Statement](#)



RECENT PWLE ENGAGEMENT

- 1. Expert Panels:** 3 persons with lived experience (PWLE) participated in expert panels, discussing new research evidence, and updating existing recommendations within the Guideline.
- 2. Feedback Surveys:** 13 PWLE completed a series of three feedback surveys; each survey evaluated different sections of the Guideline. Careful attention was paid to accessibility needs while developing the surveys and communicating instructions via email.
- 3. Focus Groups:** 9 PWLE participated in a focus group series, with the purpose to better understand the rehabilitation needs after sustaining a TBI and ensure that the Guideline reflects these needs.



IMPROVED RESOURCES



THE STANDARDS FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TRAUMATIC BRAIN INJURY (TBI) A Summary for Patients and Caregivers/Families

The Canadian Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI believes in providing the best information to health care providers, patients, and caregivers/families.

The standards for care are about helping people get the right care, from the right provider, at the right time. The standards tell people what they need to know about quality care for TBI and can help them advocate for the services they need. These standards are not mandated so it may not be possible for every care setting to follow every standard at this time. It is hoped that all care settings will strive to provide care consistent with all of these standards, even those that are currently aspirational.

For more information about recovering from a moderate to severe TBI, read our [patient handbook](#), and visit the websites for the [Canadian TBI Guideline](#) and [Neurotrauma Care Pathways Project](#).



We recommend that all people with a TBI...

1

receive timely, specialized coordinated interprofessional rehabilitation services based on their needs and choices as soon as they are medically stable.

People with a TBI should have a core team that includes the services of a:

- speech-language pathologist
- occupational therapist
- physiotherapist
- social worker
- psychologist
- nurse
- physician/physiatrist



*They might also need the services of a:

- neuropsychologist
- psychiatrist
- neuropsychiatrist
- rehabilitation support personnel
- nutritionist
- recreational therapist
- personal support worker
- psychotherapist
- pharmacist
- neurologist

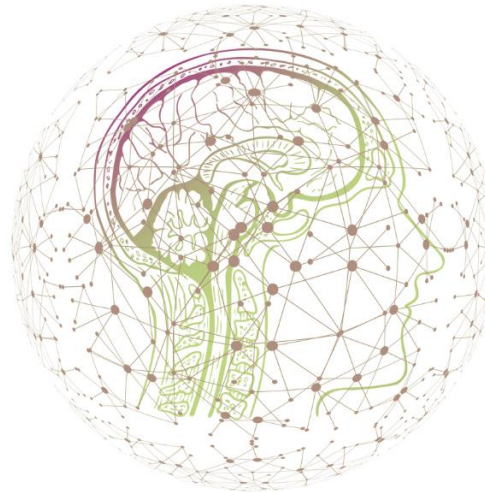
*Other specialists may be required based on the individual's needs.

Standards for the Rehabilitation of Adults with Moderate to Severe TBI

Canadian TBI Clinical Practice Guideline ©2023



CANADIAN CLINICAL PRACTICE GUIDELINE FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI



Understanding Traumatic Brain Injury A HANDBOOK FOR SURVIVORS AND CAREGIVERS ON THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TRAUMATIC BRAIN INJURY

Canadian Clinical Practice Guideline ©2023



CANADIAN CLINICAL PRACTICE GUIDELINE FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI

UNDERSTANDING TRAUMATIC BRAIN INJURY

1 | TRAUMATIC BRAIN INJURY (TBI) REHABILITATION

- Every person with a TBI should receive timely, specialized, and interprofessional rehabilitation services.
- Assessment of injury and planning of rehabilitation should be done by a coordinated team of health care providers with different specialties.
- As every person is different and has unique needs, a case coordinator is helpful to organize and oversee the TBI rehabilitation program.
- The setting of rehabilitation programs and therapies should be comfortable to the person with TBI and beneficial for their recovery.

2 | ASSESSMENT AND RECOVERY

- As no single assessment tool can get the full picture of a person's strengths, challenges, and needs, it is important to assess physical, cognitive, and emotional capabilities.
- The [Glasgow Coma Scale \(GCS\)](#) is used to assess level of consciousness.
- The [Rancho Los Amigos Scale](#) is used to assess recovery after TBI.
- Some people temporarily have trouble storing memories after a TBI. This is called Post Traumatic Amnesia (PTA).
- Behaviour management techniques, educating caregivers/family members, and modifying the environment can reduce or get rid of unwanted behaviours after TBI.
- Caregivers/family members may need ongoing information, support, and/or treatment, which they can access through community programs or associations.



3 | ROAD TO RECOVERY

- Individuals with TBI and their caregivers/families should be advised that recovery after TBI is lifelong and gains can be made continually over a period of months and years.
- Continued effort and practice using strategies provided during rehabilitation will be supportive to both the maintenance and improvement of abilities.
- Rehabilitation adapted to the specific needs of the person with TBI's daily routine and delivered in their own environment improves recovery.
- Medications should only be used with a prescription from a medical doctor/ nurse practitioner, and may not be beneficial for everyone.
- Cognitive behavioural therapy and biofeedback treatments may reduce pain symptoms in individuals with post-traumatic headaches.
- Participation in meaningful, productive activities, including work and/or volunteering, should be included early in rehabilitation programs.
- Screening for signs of mental health/substance misuse issues should happen at the start of treatment and continue regularly throughout the rehabilitation process.



4 | REINTEGRATION AND PARTICIPATION

- Receiving support through motivational interviewing, goal setting, reassurance, and problem-solving can help people with TBI reintegrate and participate in society.
- Peer support within community-based programs helps promote social integration, coping, and psychological functioning.
- An assessment by a health care provider, in accordance with local legislation, may be required for people with TBI who wish to drive.
- Return to work/school supports include cognitive, communicative, physical and behavioural strategies, work simulation activities, and on-site training. A gradual work or school trial may benefit people with TBI.



RESOURCES

Glossary of Terms
<https://kife-uhn.com/brain-injury/en/glossary>.

Brain Injury Guideline Recommendations
<https://kife-uhn.com/brain-injury/en/guidelines>

Ontario Brain Injury Association (OBIA)
<http://obia.ca>

The ABCs of Brain Injury
<https://obia.ca/resources/brain-injury-information/>

Peer Support Groups at Local Brain Injury Associations
<http://obia.ca/abi-associations/>

Online Caregiver Support Group
<https://obia.ca/support/online-caregiver-support-group/>

Caregiving and TBI
<https://obia.ca/seasons-of-caregiving-challenges-skills-and-strategies/>

Referral Database
<http://concussionsontario.org/standards/100-is-resources/referral-indicators/>

Canadian Clinical Practice Guideline ©2023

Canadian TBI Guideline



NEW RECOMMENDATIONS

- Three new recommendations developed from the feedback received from people with lived experience (PWLE)
 - the need for **ongoing therapy** when transitioning into the community
 - safe engagement in **meaningful daily activities** allowing PWLE to capitalize on the skills and strategies provided during formal rehabilitation
 - emphasize that **recovery after TBI is lifelong**, and gains can continually be made over a period of months and years



LET'S NAVIGATE THE WEBSITE

The Canadian TBI Guideline Website:

<https://kite-uhn.com/brain-injury/en>

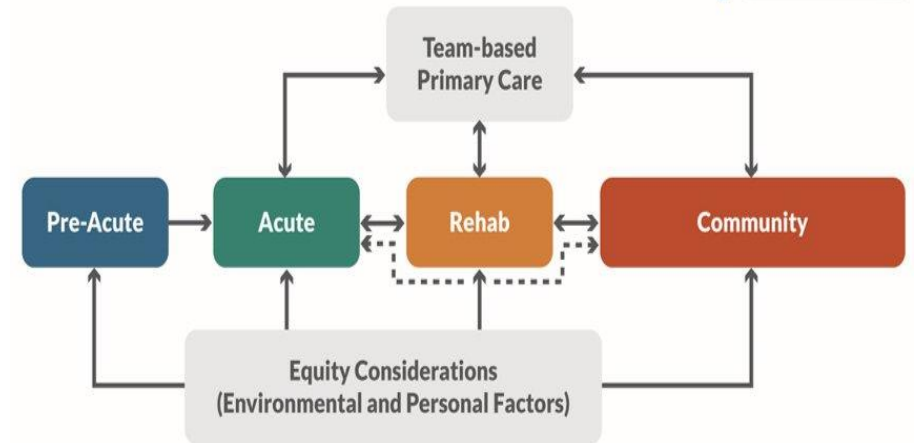


Canadian TBI Guideline



CASE EXAMPLE 1 - ROSS

Ross is a 45-year-old man who sustained a severe brain injury and had to have craniectomy and partial resection of the left temporal lobe due to severe elevated ICP.



Acute



Trauma centre

Patients with suspected brain injury should be triaged to an appropriate trauma center that can assess and manage traumatic brain injury and sequelae.



CASE EXAMPLE 1

- Ross is just arrived on the floor from the ICU and is very agitated
- He is swinging at the nurses when they enter the room and yelling loudly.



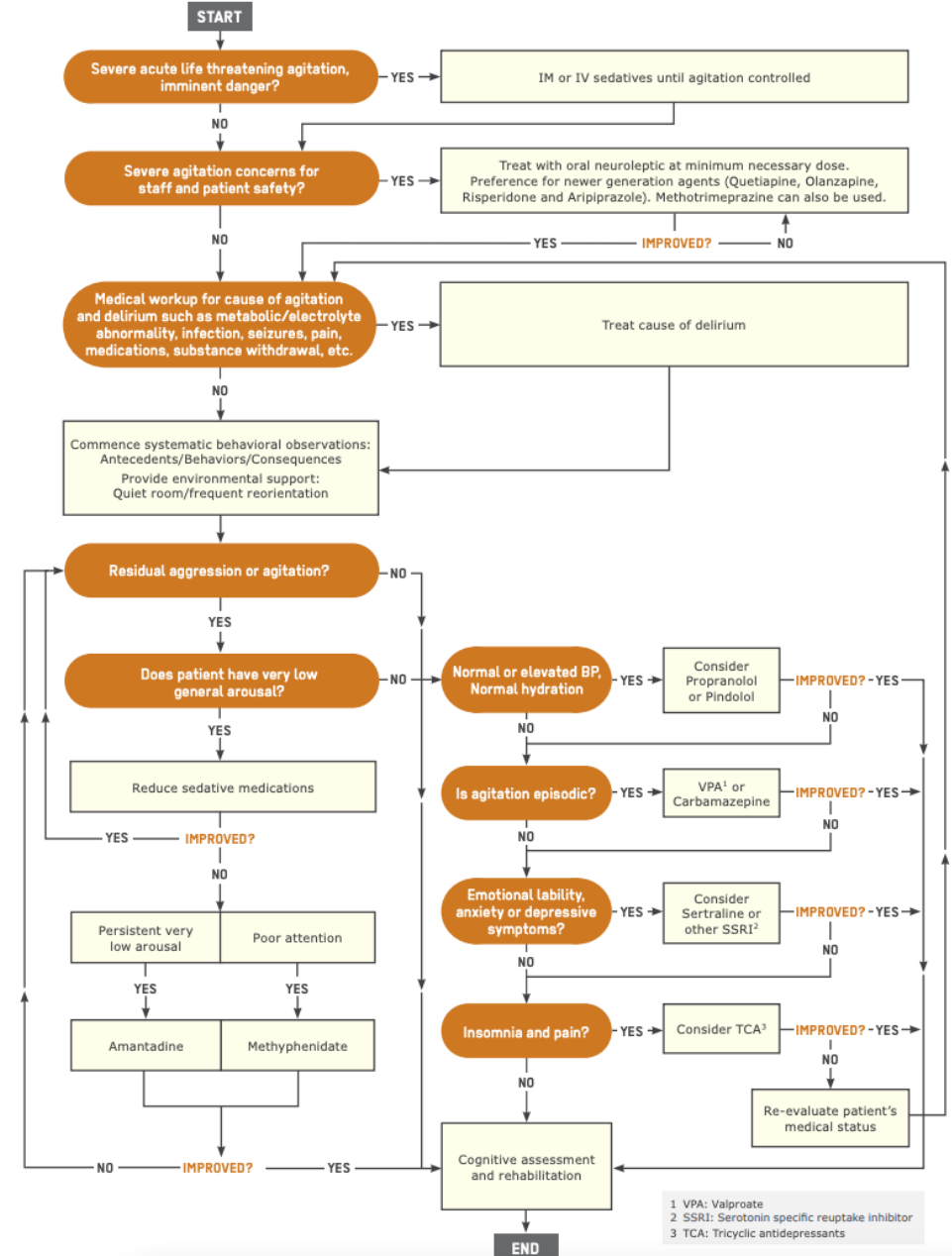
KITE | Brain Injury Contact English French

HOME GUIDELINE COMPONENTS COMMITTEES & STAKEHOLDERS METHODS RESOURCES PATIENT VERSION CONTACT US

Brain Injury Scope & Purpose Evidence Levels Recommendations Tools & Resources Key Indicators Citing the Guideline References Glossary Sex, Gender and Race Considerations

CANADIAN CLINICAL PRACTICE GUIDELINE FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI

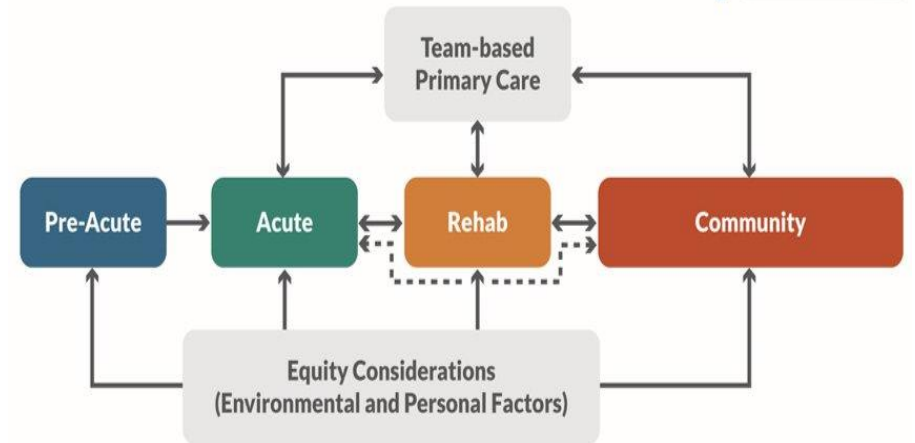
Pharmacological Management of Agitation and Aggression Following TBI





CASE EXAMPLE 1-ROSS

- With treatment with IM neuroleptics followed by oral neuroleptics Ross settles down but is still very concerned
- His blood work shows he has low sodium which is corrected
- He is more alert and has a decreased need for sedative medications



Acute

Initial medical assessment & management

Specialized assessment and management of a brain injury should occur in acute care services. Assessing brain injury as well as its complications requires trained personnel and may include diagnostic imaging, and/or screening and diagnostic tools considering physical, cognitive, behavioural, and emotional factors. Assessment should include determining the patient's decision-making and mental capacity and should follow consent procedures based on jurisdiction regulations. Initial management strategies for brain injury and its sequelae include



CASE EXAMPLE 1-ROSS

- Ross settles down but has gradually developed increased yelling when the nurses walk in the room
- Antecedent Behaviour Consequence charting is completed, and the yelling occurs only when a nurse walks in the room, and not others
- Recognize the cause is pain
- Reassurance reduces the frequency, but the behaviour persists



K. Cognitive Communication

Save PDF

- Rationale
- Key Indicators
- Tools and resources
- Summary of Evidence

P Priority F Fundamental N New Level of Evidence A B C

K.1 - Cognitive Communication Assessment

- Recommendations

K.1.1 P C

Assessment of cognitive communication abilities of individuals with traumatic brain injury should include:

- A survey or broad variety of communication situations, complexities and environments
- A case history
- The consideration of standardized and non-standardized assessments/surveys
- Specific assessments in the following areas:
 - Attention and concentration
 - Orientation
 - Verbal memory and new learning
 - Linguistic organization
 - Auditory comprehension and information processing
 - Hearing and vision
 - Oral expression and discourse
 - Reading comprehension and reading rate
 - Written expression
 - Social communication and pragmatics

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E - Caregivers and Families

F - Brain Injury Education and Awareness

G - Capacity and Consent

H - Comprehensive Assessment of the Person with TBI

I - Disorders of Consciousness

J - Cognitive Functions

K - Cognitive Communication

L - Dysphagia and Nutrition

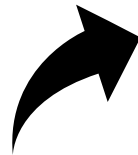


CASE EXAMPLE 1-ROSS

- Ross improves but the subacute rehab team feels they could improve the efficiency of the care they provide to people like him
- What are some of the key practices?
- HINT: This is a system question

Section 1 - Components of the Optimal TBI Rehabilitation System

- A - Key Components of TBI Rehabilitation
- B - Telehealth
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- E - Caregivers and Families
- F - Brain Injury Education and Awareness
- G - Capacity and Consent



C. Subacute Rehabilitation

Save PDF

- ▶ Rationale
- ▶ System Implications
- ▶ Key Indicators
- ▶ Tools and resources
- ▶ Summary of Evidence

P Priority **F** Fundamental **N** New Level of Evidence **A** **B** **C**

C.1 - TBI Inpatient Rehabilitation Models

- ▶ Recommendations

C.2 - Duration, Intensity and Other Attributes

- ▶ Recommendations

C.2.1 **P** **C**
A target length of stay should be established with input from persons with traumatic brain injury (TBI) and their families/caregivers as soon as possible after admission to

Guidelines Index

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E - Caregivers and Families

F - Brain Injury Education and Awareness

G - Capacity and Consent

H - Comprehensive Assessment of the Person with TBI





CASE EXAMPLE 1-ROSS

- A new doctor comes on the service and asks why the patient needs more intense cognitive rehabilitation
- “Where’s the evidence”

Summary of Evidence

Several studies have been conducted on cognitive rehabilitation post ABI. Five large, robust systematic reviews were conducted by the INCOG group on the following domains of cognition: post-traumatic amnesia (PTA), attention, executive functioning, communication, and learning and memory (Jennie Ponsford et al., 2014; J. Ponsford & Sinclair, 2014; R. Tate et al., 2014; L. Togher et al., 2014; Velikonja et al., 2014). When assessing cognitive impairment, initially, it is important to consider other factors besides the injury such as a patient’s cultural background, premorbid intelligence, substance abuse, or mental illness, as these have been found to impact one’s cognitive abilities (MacMillan, Hart, Martelli, & Zasler, 2002; Prigatano & Leathern, 1993; L. A. Taylor, Kreuzer, Demm, & Meade, 2003).

Deficits in attention are a common complaint amongst patients. Attentional disorders can impede patients’ activities of daily living, ability to drive and their vocational status. Rehabilitation strategies for attention include tasks that emulate everyday activities. In an RCT, Fasotti, Kovacs, Eling, and Brouwer (2000) employed a training program that emulated many real life tasks versus a verbal instruction program for improving attention. The authors noted greater concentration and speed of processing in participants exposed to the real life task program in their everyday tasks.

Dual task training is another effective way to train attention; this rehabilitation strategy



J. Cognitive Functions

- ▶ Rationale
- ▶ System Implications
- ▶ Key Indicators
- ▶ Tools and resources
- ▶ Summary of Evidence

P Priority **F** Fundamental **N** New Level of Evidence **A** **B** **C**



CASE EXAMPLE 1-ROSS



- Discharge planning needs to be patient centred
- Integral role of Team-Based Primary Care



D. Promoting Reintegration and Participation

Save PDF

- Rationale
- System Implications
- Key Indicators
- Tools and resources
- Summary of Evidence

P Priority F Fundamental N New Level of Evidence A B C

D.1 - Postdischarge Follow-Up and Support

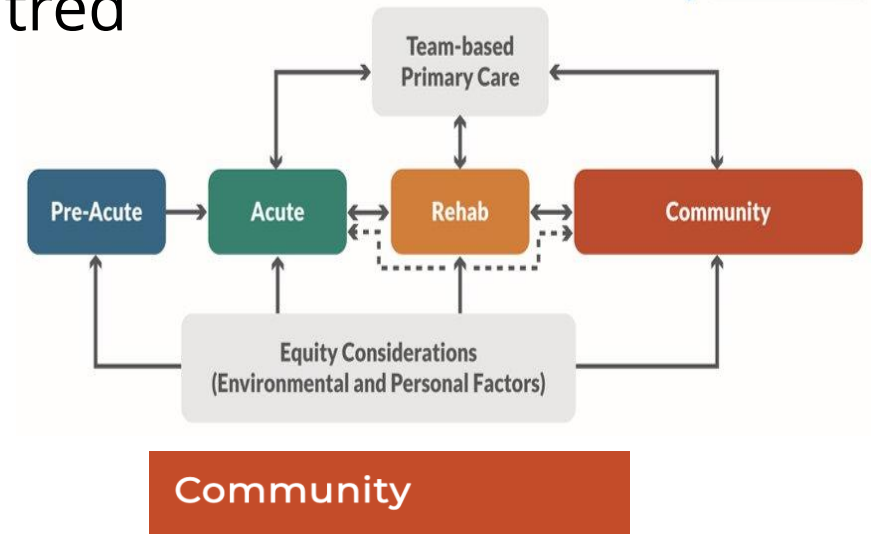
- Recommendations

D.1.1 P B
 All persons with traumatic brain injury (TBI) discharged from a specialized TBI rehabilitation program (inpatient, outpatient, residential) should have access to scheduled telephone, virtual or in person follow-up contact with a professional trained in working with persons after brain injury. It is preferable that this professional have skills in promotion of self-management skills, motivational interviewing, and goal setting, in order to adequately provide reassurance and problem-solving support.

(Adapted from INESSS-ONF, 2015)

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- G - Capacity and Consent
- H - Comprehensive Assessment of the Person with TBI
- I - Disorders of Consciousness



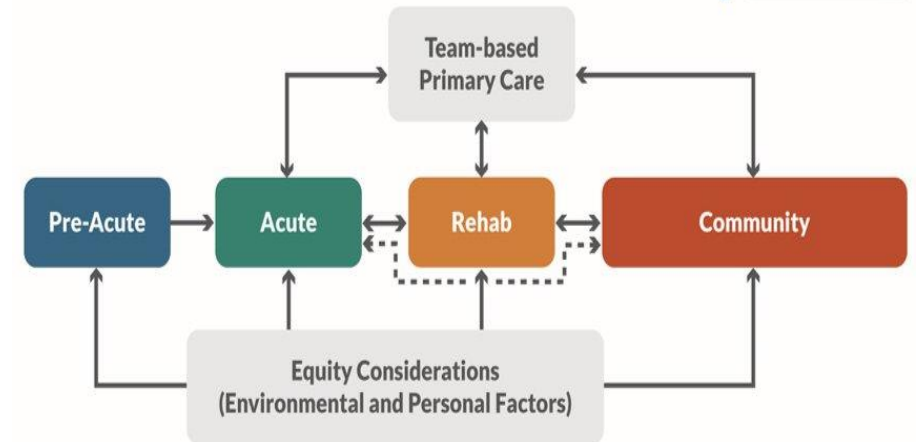
Community follow-up

- Follow-up can be provided by acute care, primary care, family health teams, and community service providers
- Follow-up must be needs-based and integrated across providers so that there are no gaps or unnecessary delays in care



CASE EXAMPLE 2 - LISA

- 30-year-old woman married with no children
- Skiing accident sustaining a severe TBI
- Initial Glasgow Coma Scale = 8
- Coma for 48 hours and PTA for 7 days
- Mild left hemiparesis
- Initially irritable/restless but improves – continues to be a little impulsive/lack insight
- Admitted for rehab 3 weeks post injury



Acute



Trauma centre

Patients with suspected brain injury should be triaged to an appropriate trauma center that can assess and manage traumatic brain injury and sequelae.



CASE EXAMPLE 2-LISA

- In inpatient rehab - became independent in ADL and minimal supervision with community living skills
- Receives outpatient rehabilitation and improves with PT and OT
- Husband notices some ongoing irritability and memory impairment
- Very supportive employer who is willing to take her back
- Returns to work 8 months after injury as a lab technician

Interprofessional Specialized Rehab

Specialized inpatient

Interprofessional Specialized Rehab

Specialized outpatient

- Rehabilitation activities must be strengths-based
- Rehabilitation activities must be based on the person's goals, interests, and injury status/progression
- Care must be coordinated, planned, and person-oriented



> D - Promoting Reintegration and Participation

- D.1 - Postdischarge Follow-Up and Support
- D.2 - Community Rehabilitation
- D.3 - Optimizing Performance in Daily Living
- D.4 - Leisure and Recreation
- D.5 - Driving
- D.6 - Vocational / Educational Rehabilitation

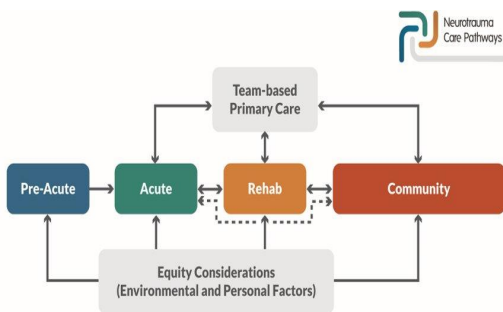
> E - Caregivers and Families



CASE EXAMPLE 2-LISA

2 Years Later:

- Gained 25 lbs. Lisa is anxious about going to the gym because she is aware of the appearance of the very mild hemiparesis
- Her husband is reporting challenges in their relationship including lack of awareness of impact on others, impulsivity, and emotional lability
- Her employer has expressed concerns about her memory, occasional outbursts, and problem-solving skills



Community

Activity re-integration & life roles: planning and support

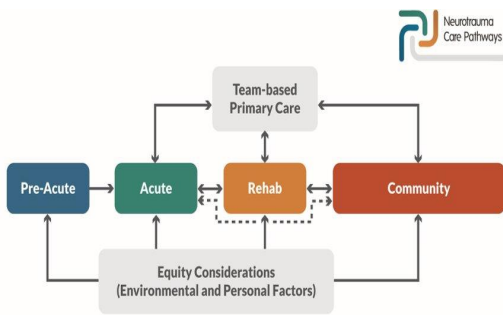
Ongoing re-assessment & implementation of community supports



CASE EXAMPLE 2-LISA

2 Years Later:

- Lisa laid off with other more junior workers as her laboratory faces cutbacks due to decreased government funding
- Lisa's mood is low because of lack of meaningful activities
- Lisa would like to start a family however her husband is concerned that she may not be able to manage a new baby



Community

Activity re-integration & life roles: planning and support

Ongoing re-assessment & implementation of community supports



CASE EXAMPLE 2-LISA

Problems illustrated by Lisa's Case:

- Irritability
- Memory
- Fatigability
- Cognitive communication
- Social cognition
- Vocational return
- Executive skills

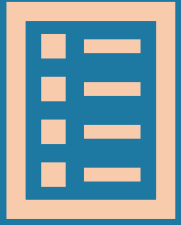


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- > N - Sensory Impairment
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- > Q - Psychosocial / Adaptation Issues
- > R - Neurobehaviour and Mental Health
- > S - Substance Use Disorders
- > T - Medical / Nursing Management
- > U - Intimacy and Sexuality



CASE EXAMPLE 2 -LISA

Early rehabilitation - Problems with Irritability

- Lisa's husband is provided with education about the signs of irritability and, after working with the team to do an antecedent analysis, recognizes that Lisa is irritable when she is tired, has slept poorly, or if they spend longer than 1.5 hours in busy environments such as public places.

Early rehabilitation - Problems with Fatigue

- Lisa is found to have hypothyroidism and feels a little better after diagnosis
- Lisa is taught about sleep hygiene

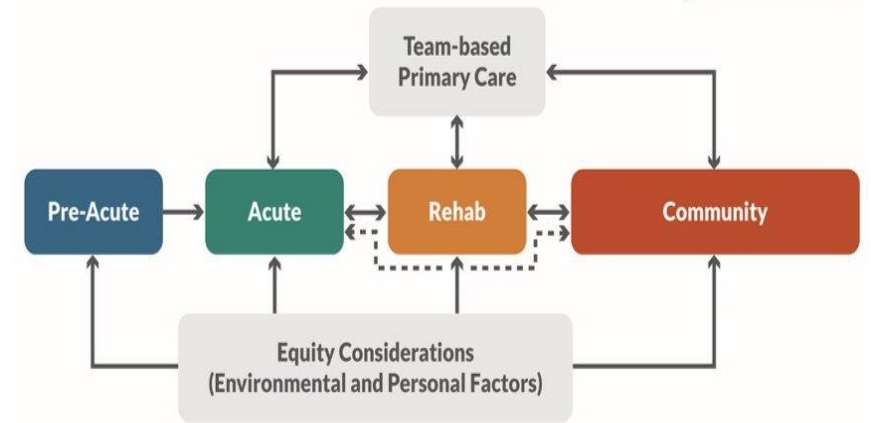


CASE EXAMPLE 2-LISA



Optimization of learned activities in the Community:

- Lisa's therapist takes her to the gym, and she gets into a routine that she follows



Community ×

Re-access planning & coordination

As a person with brain injury's needs change over time and in relation to ageing, mechanisms to facilitate their re-access to the healthcare system are essential. The person with brain injury's primary care provider should be prioritized as the first access point to plan and coordinate re-access needs. Persons with brain injury may require re-entry to acute care or rehabilitation, depending on the severity of the change in outcome.

Community

Specialized community services & supports

Community

Activity re-integration & life roles: planning and support





CASE EXAMPLE 2-LISA

Cognitive Communication:

- Communication impairments resulting from underlying cognitive deficits due to neurological impairment
- Difficulties in communicative competence (listening, speaking, reading, writing, conversation, and social interaction)
- Result from underlying cognitive impairments (attention, memory, organization, information processing, problem solving, executive functions) (CASLPO).



K. Cognitive Communication

Save PDF

- ▶ Rationale
- ▶ Key Indicators
- ▶ Tools and resources
- ▶ Summary of Evidence

P Priority F Fundamental N New Level of Evidence A B C

K.1 - Cognitive Communication Assessment

- ▶ Recommendations
 - K.1.1 **P C**
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 - A case history
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- L - Dysphagia and Nutrition





CASE EXAMPLE 2-LISA

Social Cognition:

- Social cognition includes processes such as emotion recognition from facial affect and voice and Theory of Mind (the belief that others have thoughts separate from one's own and that these thoughts influence others' behaviors).

> [Brain Inj.](#) 2014;28(1):97-104. doi: 10.3109/02699052.2013.856475.

Facial affect recognition difficulties in traumatic brain injury rehabilitation services

Angela M Biszak ¹, Duncan R Babbage

Affiliations + expand

PMID: 24328805 DOI: 10.3109/02699052.2013.856475



CASE EXAMPLE 2-LISA

- With **cognitive communication** training, Lisa is better able to recognize the social cues
- When she loses track of conversation gets clarification from her boss or colleague



K. Cognitive Communication

Save PDF

- ▶ Rationale
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P Priority F Fundamental N New Level of Evidence A B C

K.1 - Cognitive Communication Assessment

- ▶ Recommendations

K.2 - Cognitive Communication Rehabilitation

- ▶ Recommendations

K.2.1 A

A person with TBI who has a cognitive-communication disorder should be provided with interventions and intervention materials that are both grounded in the principles of cognitive-communication rehabilitation and individualized, taking the person's context into account to maximize communication competence
(Updated from INCOG 2014,²³ Cognitive-communication 2, p. 356)

Recommended cognitive-communication interventions, can be direct or indirect at any level of impairment and include:

- Communication partner training (Level A)
- Communication strategy and metacognitive awareness training (Level A),
- Reintegration to daily functions, productive activities, participation and competence, modification of the communication environment, assistance with adjustment to impairments,

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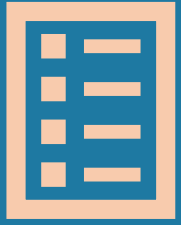
CASE EXAMPLE 2-LISA

- Commences use of her iPhone to address **memory issues**
- Let's move into the 21st century!
- Lisa is taught some internal strategies for memory in her own environment



Section 2 - Assessment and Rehabilitation of Brain Injury Sequelae

- H - Comprehensive Assessment of the Person with TBI
- I - Disorders of Consciousness
- J - Cognitive Functions
 - J.1 - Cognitive Functions Assessment
 - J.2 - Cognitive Rehabilitation Principles
 - J.3 - Medication for Arousal and Attention
 - J.4 - Attention / Information Processing
 - J.5 - Learning and Memory
 - J.6 - Medication for Memory
 - J.7 - Executive Functions



CASE EXAMPLE 2

Behavioural Changes/Irritability

- Lisa and her husband have learned to avoid the busy malls however find that it somewhat limiting their lifestyle

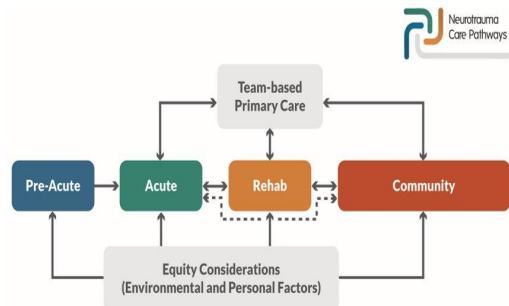
Vocational Rehab

- With education the employer recognizes Lisa's situations that are problematic and prompts her when she observes issues.
- Lisa receives training in certain metacognitive training and executive problem-solving and adopts use of these on a regular basis



CASE EXAMPLE 2-LISA

- Avoids layoffs despite impairments
- Continues to require ongoing employment of techniques
- Now hoping to start a family

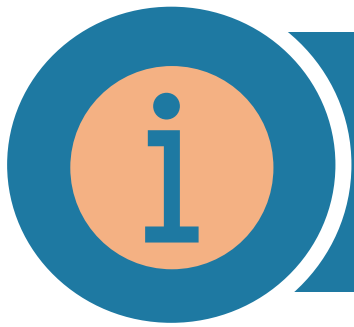


Community

Activity re-integration & life roles: planning and support

Ongoing re-assessment & implementation of community supports

Support for person with traumatic brain injury's family/friends, caregivers



KEY TAKEAWAYS

- **Evidence-based** Care Pathways and Living Clinical Practice Guidelines and companion resources are easily accessible
- Value of providing **education to patients (and families)** about symptom management, treatment and prognosis
- Importance of timely comprehensive individualized assessment with validated evidence-based tools
- **Team-based care** is necessary with clear ways of evaluating the effectiveness of the treatment
- Importance of **effective care coordination** so patients can be seen by specialists and other clinicians with needed information at hand for timely and appropriate treatment decision-making



NEXT STEPS

- **Pathways Project:**
 - Continue to focus on implementation and system evaluation
 - Continue to engage key partners, particularly PWLE, to ensure priorities and gaps are being addressed
- **Living Guideline:**
 - Continue to update and improve the content; add implementation tools and resources
 - Gather feedback from a diverse set of knowledge users to improve the content, resources and implementation
- **Knowledge Mobilization**
 - Regulated healthcare professionals, system planners, clinical managers and funders
 - Brain injury and spinal cord injury organizations

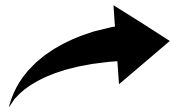




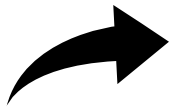
HOW TO USE THE PATHWAY



<https://www.neurotraumapathways.ca/>



- About Us >
- Mild TBI (Concussion) >
- Moderate to Severe TBI >
- Traumatic SCI >
- Persons With Lived Experience Engagement
- Resources >



Pre-Acute	Acute	Interprofessional Specialized Rehab	Community
Equity Considerations (Environmental and Personal Factors)	Equity Considerations (Environmental and Personal Factors)	Equity Considerations (Environmental and Personal Factors)	Equity Considerations (Environmental and Personal Factors)
On-site injury assessment & management	Trauma centre	Specialized inpatient	Team-based primary care
Spinal immobilization	Health systems data transfer	Specialized outpatient	Specialized community services & supports
Extrication & transportation	Initial medical assessment & management	Health systems data transfer	Health systems data transfer
Patient's destination (Triage of resources)	Surgical consultation	In-person / virtual assessment & management of symptoms	In-person / virtual assessment & management of new / prolonged symptoms
Communication with patient's emergency contact(s)	Surgery & critical care	Ongoing education (Person, family, healthcare/service provider)	Ongoing education (Person, family, healthcare/service provider)
Pre-hospital documentation	Ongoing education (Person, family, healthcare/service provider)	Plan re-integration & life roles	Activity re-integration & life roles: planning and support
	Transfer & interprofessional care coordination	Transfer & interprofessional care coordination	Transfer & interprofessional care coordination
	Assessment & planning of community supports	Assessment & planning of community supports (cont. from Acute)	Ongoing re-assessment & implementation of community supports
	Transition planning	Transition planning (cont. from Acute)	Community care documentation
	Acute care documentation	Rehab care documentation	Community follow-up
	Community follow-up	Community follow-up	Specialized navigation support for persons and families
		Specialized navigation support for persons and families	Support for person with traumatic brain injury's family/friends, caregivers
		Support for family and friends	Peer support
		Peer support	Re-access planning & coordination

Acute

Trauma centre

Patients with suspected brain injury should be triaged to an appropriate trauma center that can assess and manage traumatic brain injury and sequelae.

In this block, first responders and acute care providers will find a list of trauma centers and specialized brain injury centres in Ontario.

RESOURCES

A summary of trauma centers and acute hospitals with neuro-capacity (i.e., capacity to care for persons experiencing a traumatic brain injury) in Ontario, by Ontario Health Region, as well as regional summary tables detailing hospital names can be found here: [Summary of Regional Publicly Funded Services](#)





HOW TO USE THE TBI GUIDELINE



**CANADIAN
CLINICAL PRACTICE GUIDELINE**
FOR THE REHABILITATION OF ADULTS
WITH MODERATE TO SEVERE TBI

<https://kite-uhn.com/brain-injury/en/guidelines>



Canadian TBI Guideline

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- > A - Key Components of TBI Rehabilitation
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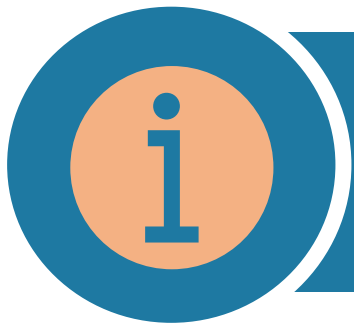
P. Pain and Headaches

- > Rationale
- > System Implications
- > Key Indicators
- > Tools and resources
- > Summary of Evidence

P Priority **F** Fundamental **N** New Level of Evidence **A** **B** **C**

P.1 - Assessment of Pain and Headaches

- > Recommendations
 - P.1.1 C**
Pain should always be considered if a person with traumatic brain injury presents agitation or has cognitive/communication issues, non-verbal psychomotor restlessness or worsening spasticity, with particular attention paid to non-verbal signs of pain (e.g., grimacing).
(ABIKUS 2007, G73, p. 27)
Suggested tool: [Algorithm for Agitation and Aggression](#)
 - P.1.2 N C**
Individuals experiencing persistent pain following brain injury should be examined for musculoskeletal, visceral, central and peripheral nervous system causes of pain by a clinician experienced in neurological and musculoskeletal examinations to determine the likely cause of pain.
 - P.1.3 N C**



LIVING CONCUSSION GUIDELINES



LIVING
CONCUSSION
GUIDELINES

[Home](#) | [About](#) |[Guideline Sections](#) ▾[Methods](#) ▾[Presentations and Products](#)[Resources](#) ▾[Patient Version](#)[Pediatric Guideline](#)

Guideline Sections

Diagnosis

Initial Management

Sport-Related
Concussion

Diagnosis/Assessment
of Prolonged Symptoms

Management of
Prolonged Symptoms

Post-Traumatic
Headache

Sleep-Wake
Disturbances

Mental Health
Disorders

Cognitive Difficulties

Vestibular (Balance/
Dizziness) & Vision
Dysfunction

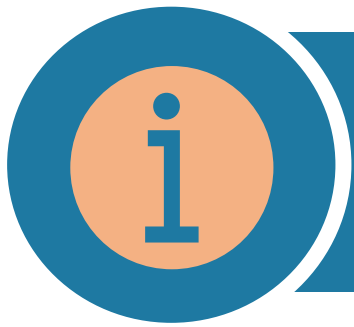
Fatigue

Return-to-Activity /
Work / School
Considerations

**Living
Concussion
Guidelines for
Adults:**



<https://concussionsontario.org/>



LIVING CONCUSSION GUIDELINES

CLINICAL GUIDELINE ▾ RESOURCES ▾ ABOUT ▾ UPDATES ▾ FR ADULT GUIDELINES X Q



The Living Guideline for Pediatric Concussion Care shares up-to-date evidence-based clinical recommendations & tools for healthcare professionals diagnosing and managing children and adolescents with concussion. This project is funded by the Ontario Ministry of Health in Canada and includes over 45 volunteer concussion experts from across the US and Canada who work together to review the latest evidence and update the clinical recommendations and tools as the evidence evolves.

See the "What's New" tab for updates and scroll down for a full list of our clinical guidelines recommendations, tools, and clinical algorithms.

Clinical Practice
Guideline (web
version)



Post-
Concussion
Information
Sheet

Updated
Sept 2024

2023 Return to
Activity
Protocols

Updated
Sept 2024

Living
Guideline
Evidence Map
(References)



Download PDF
(update in
progress-check
back soon)



Cite the
Guideline

Pediatric Concussion Guideline:



<https://pedsconcussion.com/>



**CANADIAN
CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS
WITH MODERATE TO SEVERE TBI**

CONTACT INFORMATION

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[*Neurotrauma Care Pathways*](#)

afhto association of family
health teams of ontario

 **UHN** Toronto
Rehabilitation
Institute
The KITE Research Institute

Institut national
d'excellence en santé
et en services sociaux
Québec 

 **Ontario**
Ministry of Health & Long Term Care



IMPORTANT WEBSITE LINKS

Neurotrauma Care Pathways:



<https://www.neurotraumapathways.ca/>

Living Concussion Guidelines for Adults:



Peds Concussion Guideline:



<http://www.braininjuryguidelines.org/>

Canadian TBI Guideline:



<https://kite-uhn.com/can-scip>

Can-SCIP Guidelines:

