Neurotrauma Care Pathways

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

ONTARIO PHYSIOTHERAPY ASSOCIATION

Where do Physiotherapists fit into the Care Pathway after TBI? Making it relevant

Wednesday, Dec 6, 2023, 12-1pm

Neurotrauma Care Pathways Team

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Clinician Presenter

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UHN Toronto Rehabilitation Institute – The KITE Research Institute

PedsConcussion – Living Guideline for Pediatric Concussion Care

Living Concussion Guidelines

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

Ontario Ministry of Health & Long Term Care

Land Acknowledgement

We acknowledge that we are on the traditional territory of many Indigenous nations. For myself in Toronto these include the lands of 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 and healthcare providers, 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. Describe the overarching framework and features embedded in the Ideal Care Pathway after brain injury

2. Understand the Living Clinical Practice Guideline content

3. Use online evidence-based resources to find the best practice care in TBI and concussion

SCOPE OF THE PROBLEM

How many people sustain a TBI every year in Ontario?

Concussion: 164,000 - about 20% will have persisting symptoms: 32,800

Complex mild: 2,500

Moderate to severe: 3,500

TOTAL: 170,000 new injuries a year
Approximately 38,800 with ongoing needs

How do people get injured?

Concussion: **30% Fall**; 3% MVC; Sport 5%; Unspecified 41%

Complex mild: **66% Fall**; 9% MVC

Moderate to severe: **71% Fall**; 11% MVC

Data used with permission from the 2024 TBI Report Card.
Data obtained from administrative data bases by ICES.

SCOPE OF THE PROBLEM

How many people with a moderate to severe TBI receive inpatient rehabilitation?

Specialized brain injury rehab: 9%
Mixed Neuro rehab: 4%
General rehab: 5%

TOTAL: 18%

How many people have follow-up with primary care after discharge from acute care and no inpatient rehabilitation?

within 30 days of discharge - 44%;
within 90 days of discharge - an additional 16%

How many get rehab from Home and Community Care after discharge from either acute care or inpatient rehab

Physiotherapy 20%;
Occupational Therapy 21%
SLP or SW 0.7%

Data used with permission from the 2024 TBI Report Card.
Data obtained from administrative data bases by ICES.

SOLUTION

Neurotrauma Care Pathways

Care quality varies for Traumatic Brain Injury and Spinal Cord Injury because:

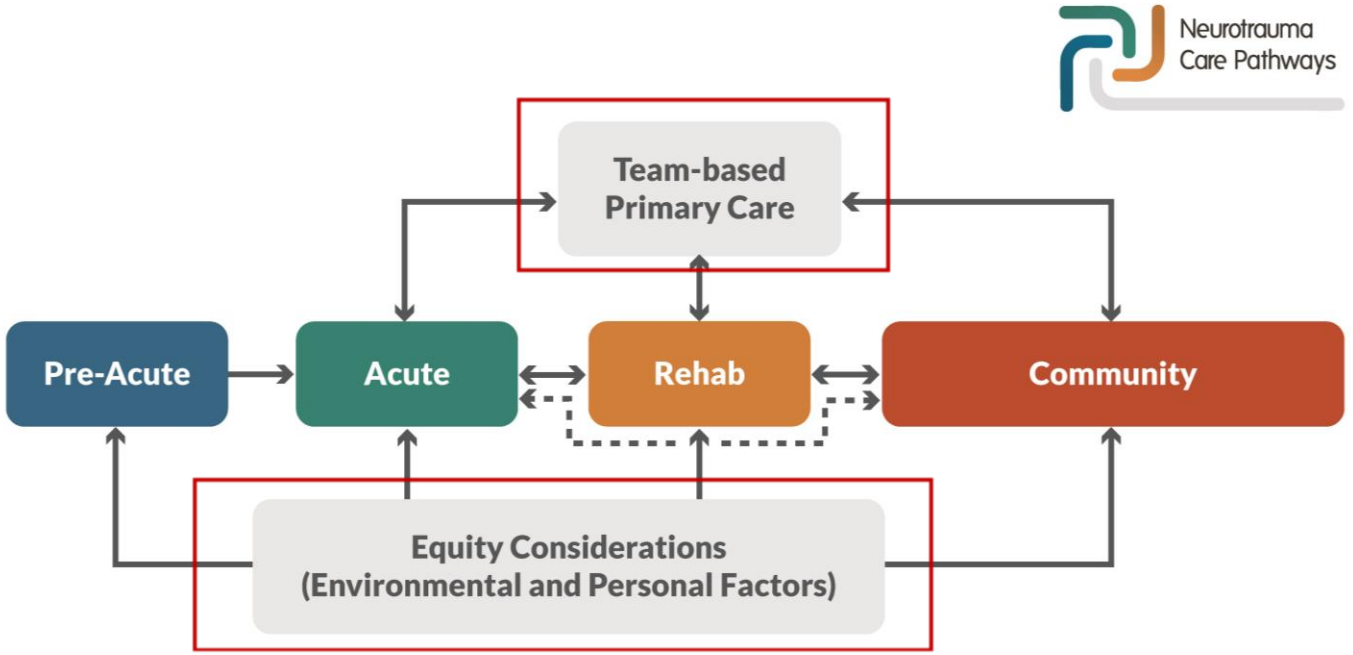
- Limited availability of specialized acute care & rehabilitation
- Poor acknowledgment of that these are chronic and complex chronic health conditions
- Lack of navigation to specialized rehab and appropriate community services & supports
- Care model and access is determined by funding (public vs third party)

AND… these variations become magnified GAPS for those who have been traditionally marginalized in the healthcare system

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**

NEUROTRAUMA CARE PATHWAYS

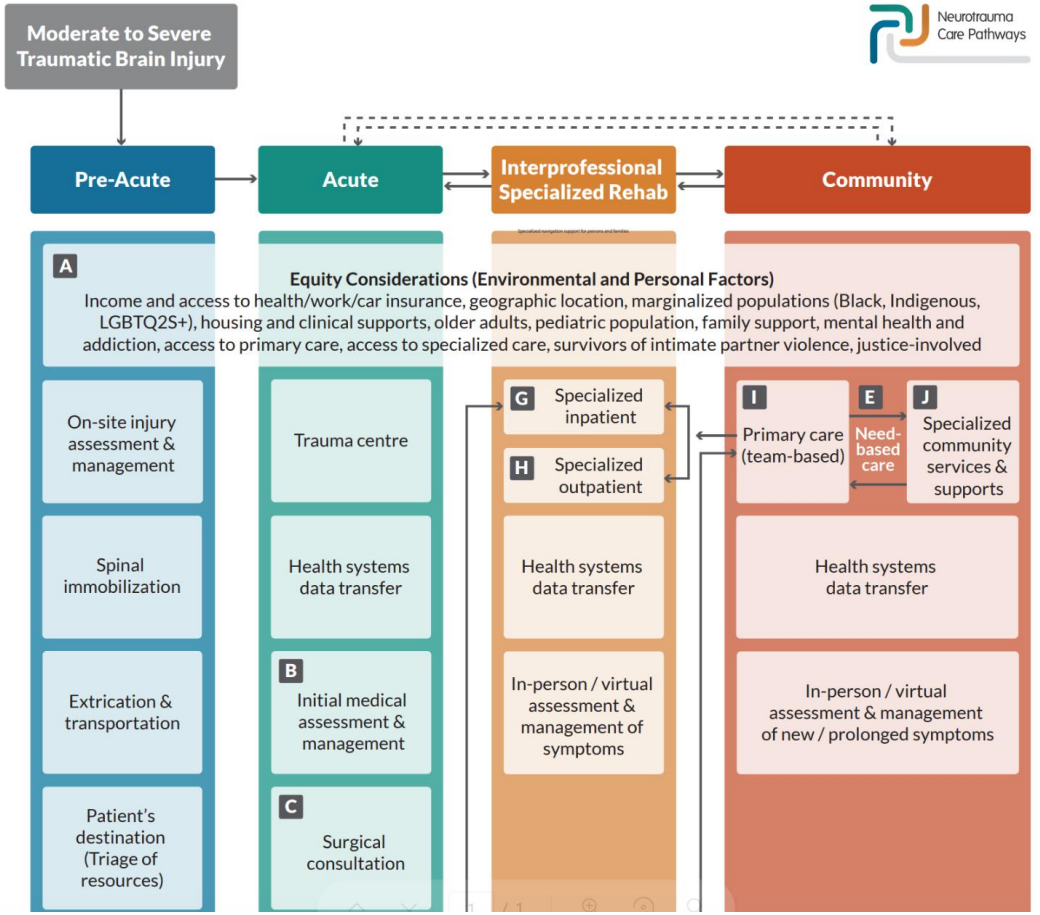
- Over 200 key partners have been engaged; particularly persons with lived experience
- Each care stage contains building blocks (key elements of care), which are linked to existing evidence-based CPGs.

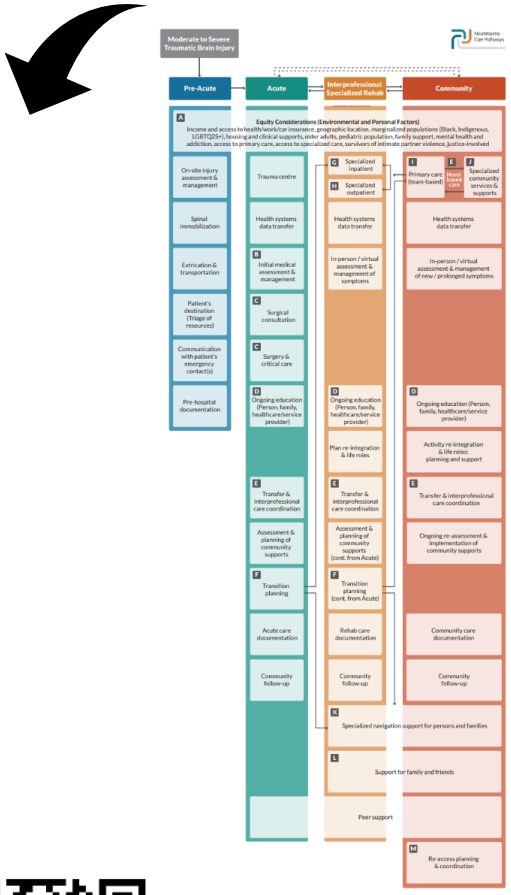


Implementation of the pathways

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.





Moderate to Severe TBI Ideal Care Pathway

QUALITY INDICATORS

System Evaluation

Indicator Type	Equity	Pre-acute	Acute	Rehab	Community	Total
Core set	3	3	13	6	9	34
Must-have	3	0	2	4	5	14
Should-have	2	0	8	4	2	16
Nice-to-have	3	1	2	0	1	7
Total	11	4	25	14	17	71

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.

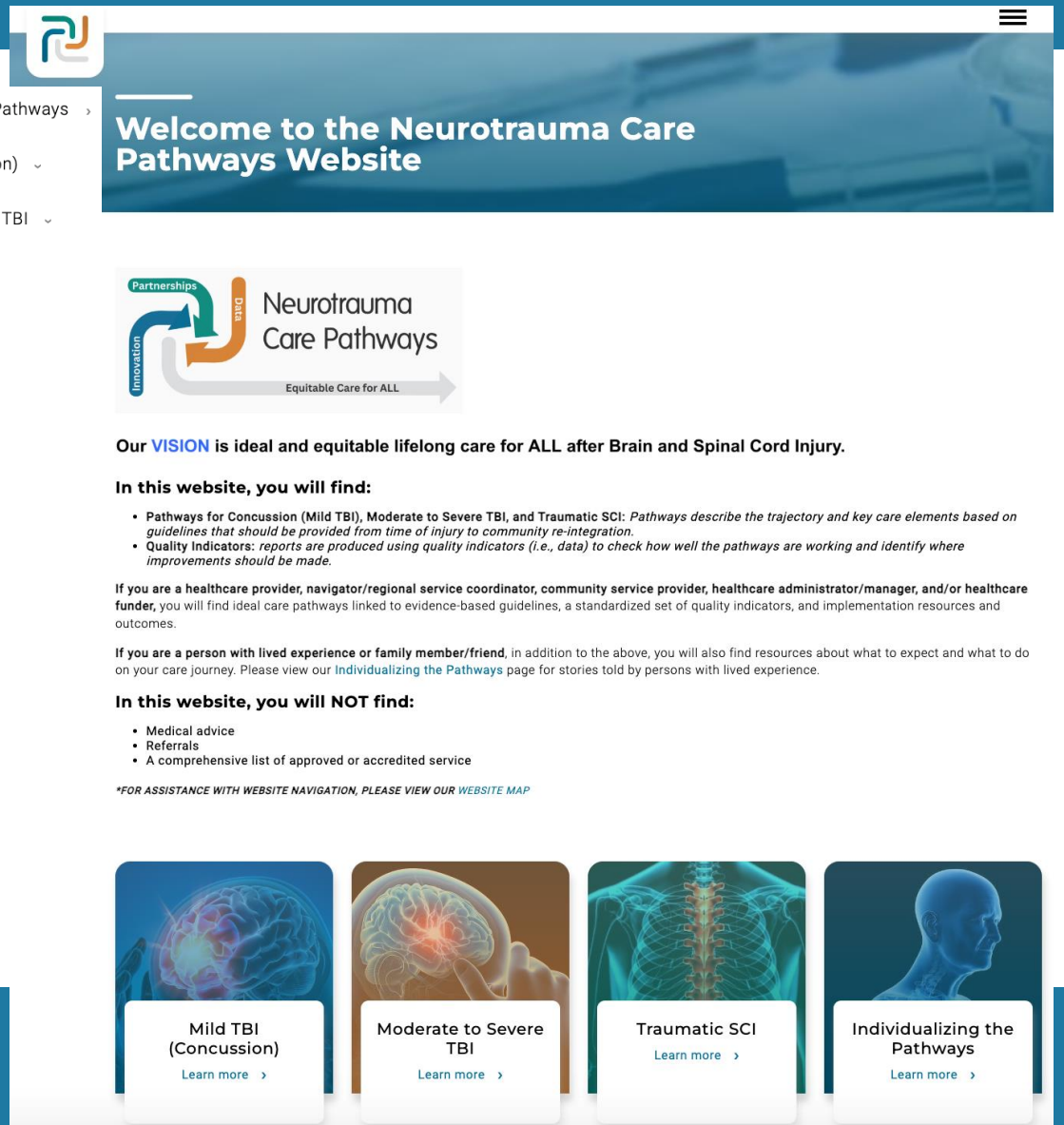
- Each Ideal Care Pathways building block of care includes
  - the definition and technical specifications of the Quality Indicator to evaluate the care stage
  - the status/feasibility of using the Quality Indicator

Some building blocks contain multiple Quality Indicators that evaluate different aspects of that stage

CARE PATHWAYS WEBSITE

Neurotrauma Care Pathways Interactive Website:

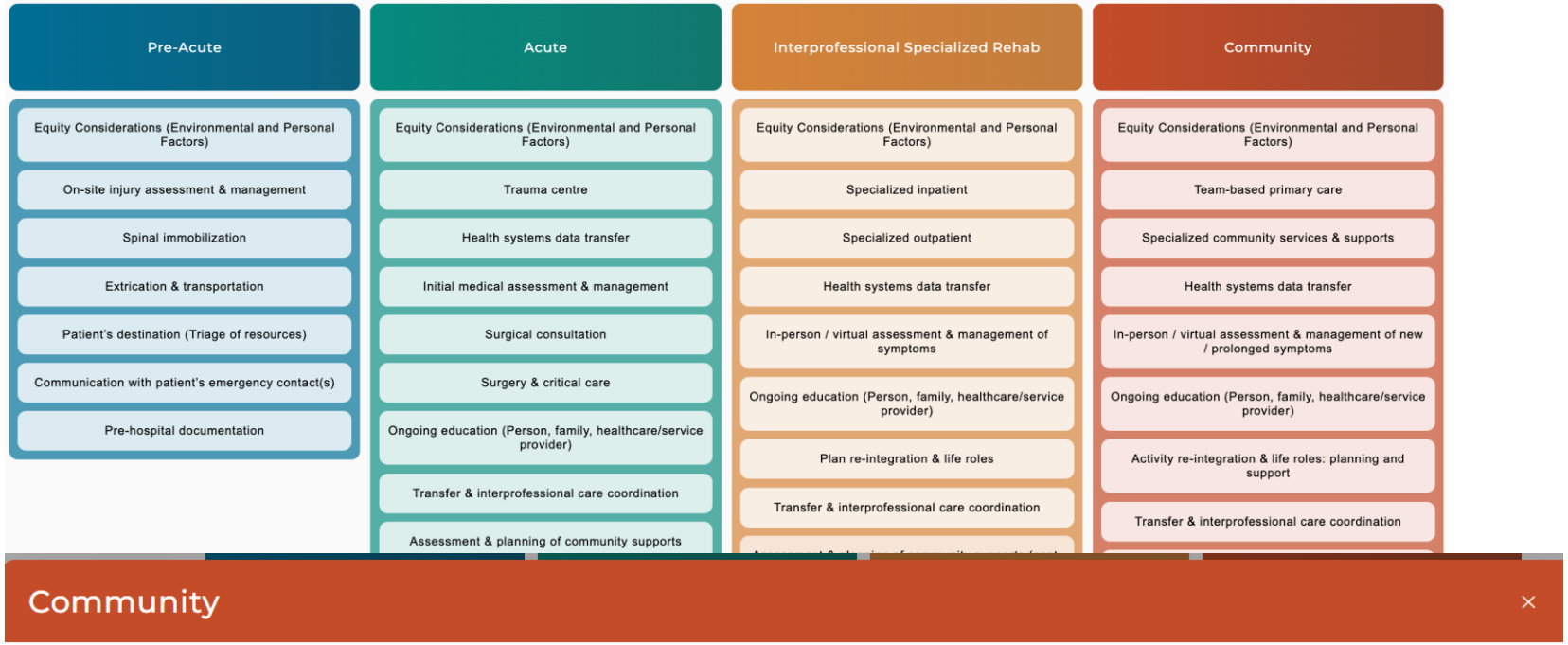
https://www.neurotraumapathways.ca



Ideal Care Pathways

HOW TO USE THE PATHWAY

- Individualizing the Pathways ›
- Mild TBI (Concussion) ⌄
- Moderate to Severe TBI ⌄
- Traumatic SCI ⌄
- Project Activities ⌄
- Resources ›
- About Us ⌄



Community

In-person / virtual assessment & management of new / prolonged symptoms

Assessment, treatment, and management strategies provided during community living should be assessed by standardized outcome measures. Re-assessment and evaluation should occur frequently as injury status changes (e.g., changes related to ageing). The results of community assessments may indicate necessary re-entry into acute care or rehabilitation for management. Re-assessment should include determining any changes to the patient's decision-making and mental capacity and should follow consent procedures based on jurisdiction regulations. Some brain injury sequelae may require ongoing reassessment in the community, as well as subsequent management of long-term sequelae and needs. It is important that community supports (rehabilitative and/or supportive) are consistent with the person's goals, interests, age, and injury status/progression. It is important that healthcare providers ensure that the provided, coordinated, and planned care be person-oriented and be designed to meet the needs of the person with brain injury, particularly those needs articulated by the person with brain injury. The person with brain injury should be encouraged and supported to safely engage in activities on their own, allowing them to capitalize on the skills and strategies provided during formal rehabilitation sessions. This includes, but is not limited to, tasks of therapeutic value targeting deficits through meaningful activities in the community.

INTRODUCTION TO GUIDELINES

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

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

https://erabi.ca/

LIVING CONCUSSION GUIDELINES

PedsConcussion
LIVING GUIDELINE FOR
PEDIATRIC CONCUSSION CARE

Can-SCIP Guideline
Canadian Spinal Cord Injury Practice Guideline

- The **LIVING** Canadian TBI Guideline, Can-SCIP Guideline, and Concussion Guidelines were designed to provide evidence-based recommendations for the rehabilitation of adults having sustained a moderate to severe TBI, concussion/mTBI, or tSCI

UHN Toronto Rehabilitation Institute
The KITE Research Institute

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

The Ottawa Hospital

Ontario
Ministry of Health & Long Term Care

PRAXIS
Spinal Cord Institute

IMPORTANT LIVING WEBSITE LINKS

Neurotrauma Care Pathways:

https://www.neurotraumapathways.ca/

Living Concussion Guidelines for Adults:

Peds Concussion Guideline:

http://www.braininjuryguidelines.org/

Canadian TBI Guideline:

Can-SCIP Guidelines:

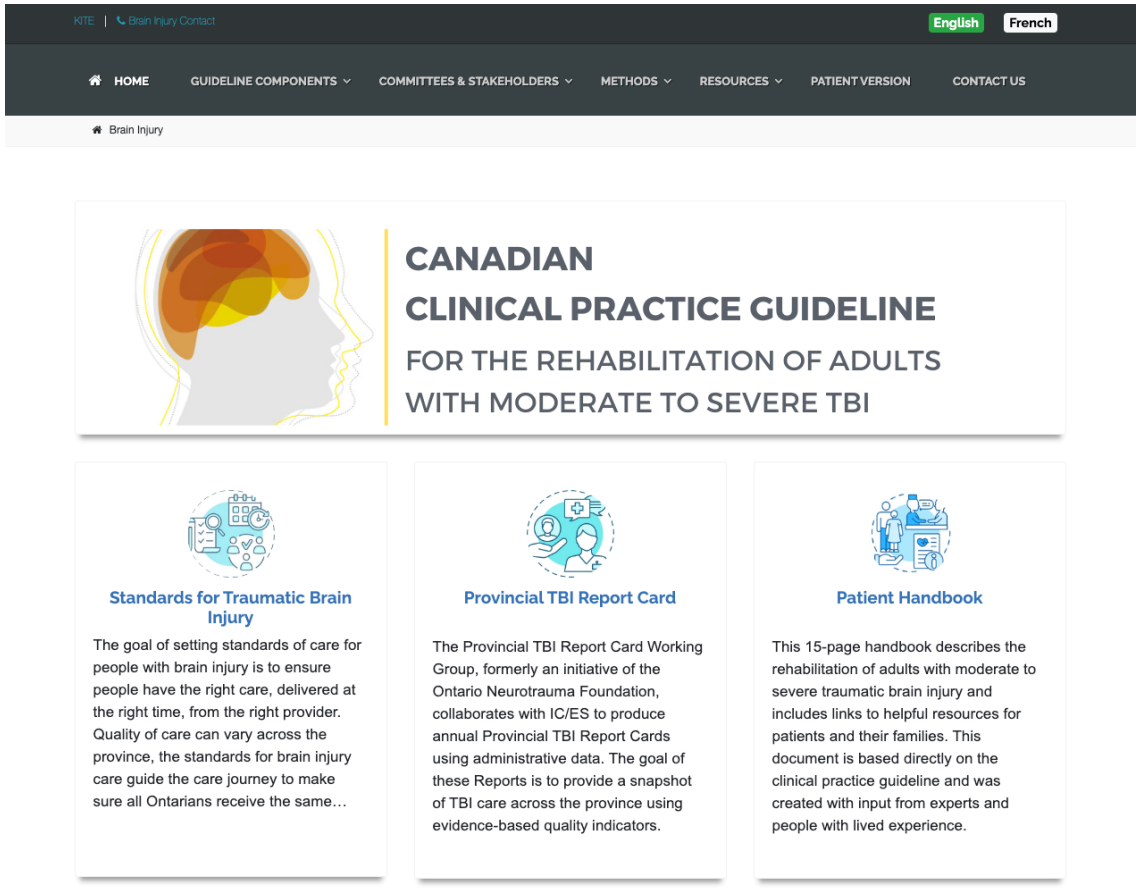
https://kite-uhn.com/can-scip

UPDATED WEBSITE

The Canadian TBI Guideline Website:

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

Canadian TBI Guideline



HOW TO USE THE TBI GUIDELINE

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

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

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

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

SECTION 1

Section 1 - Components of the Optimal TBI Rehabilitation System

- A - Key Components of TBI Rehabilitation
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NEW Chapter

- Target Audience: Health system leaders who are designing systems

SECTION 2

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- 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.

WHAT'S NEW?

November 8, 2023: Review updated evidence-based recommendations in the following sub-sections:

- Q - Psychosocial / Adaptation Issues
- R - Neurobehaviour and Mental Health
- S - Substance Use Disorders

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!

Neurotrauma Care Pathways

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)
- **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**

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

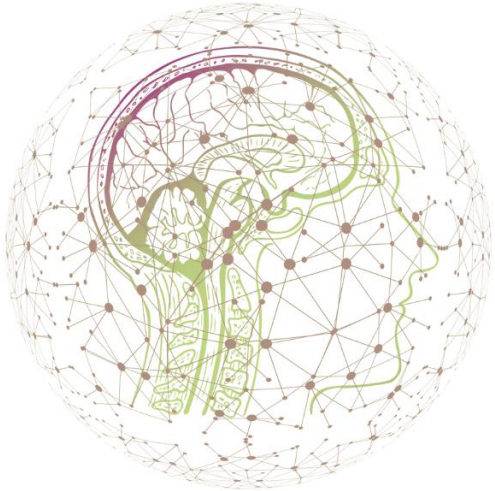
receive timely, specialized coordinated interprofessional rehabilitation services based on their needs and choices as soon as they are medically stable.

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.

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

ONF

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 to 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://kite-uhn.com/brain-injury/en/glossary

Brain Injury Guideline Recommendations
https://kite-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/tools-resources/referral-indicators/

Canadian TBI Guideline

NEW PWLE RECOMMENDATIONS

- Three new recommendations developed from the feedback received from people with lived experience (PWLE)

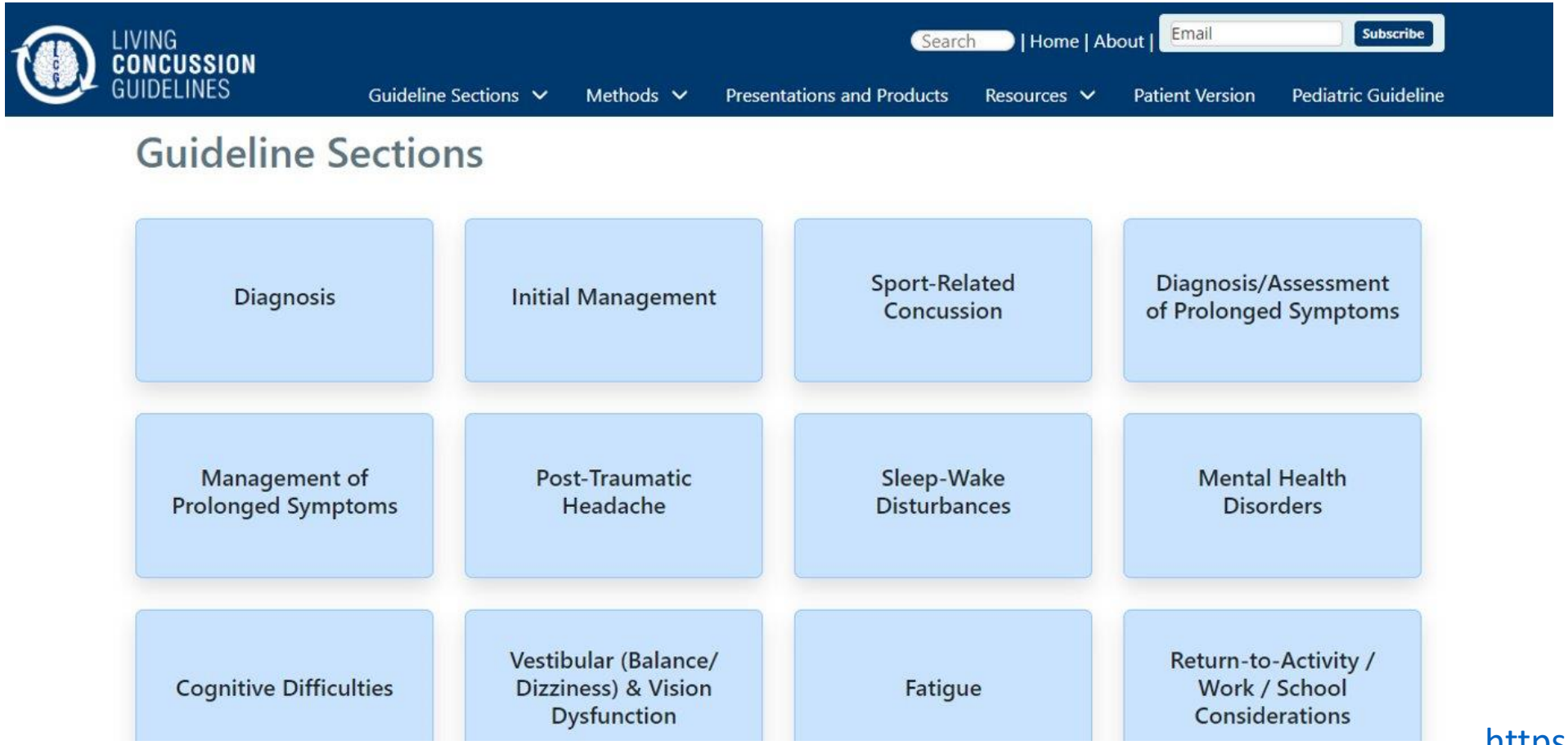
  - the need for **ongoing therapy** when transitioning into the community
  - safe engagement in **meaningful daily activities** allowing PWLE to capitalize on the skills and strategies provided during formal rehabilitation
  - emphasize that **recovery after TBI is lifelong**, and gains can continually be made over a period of months and years

Individualizing the Pathways (PWLE Stories)

NEXT STEPS

- **Pathways Project:**
  - Continue to focus on implementation and system evaluation
    - Pilot implementation projects in each Ontario Health Region
    - Report Cards and System Reports
    - Collaboration with publicly and insurance/fee for service funders
  - Continue to engage key partners, particularly PWLE, to ensure priorities and gaps are being addressed
- **Knowledge Mobilization**
  - ➢ Regulated healthcare professionals, system planners, clinical managers and funders
  - ➢ Brain injury and spinal cord injury organizations

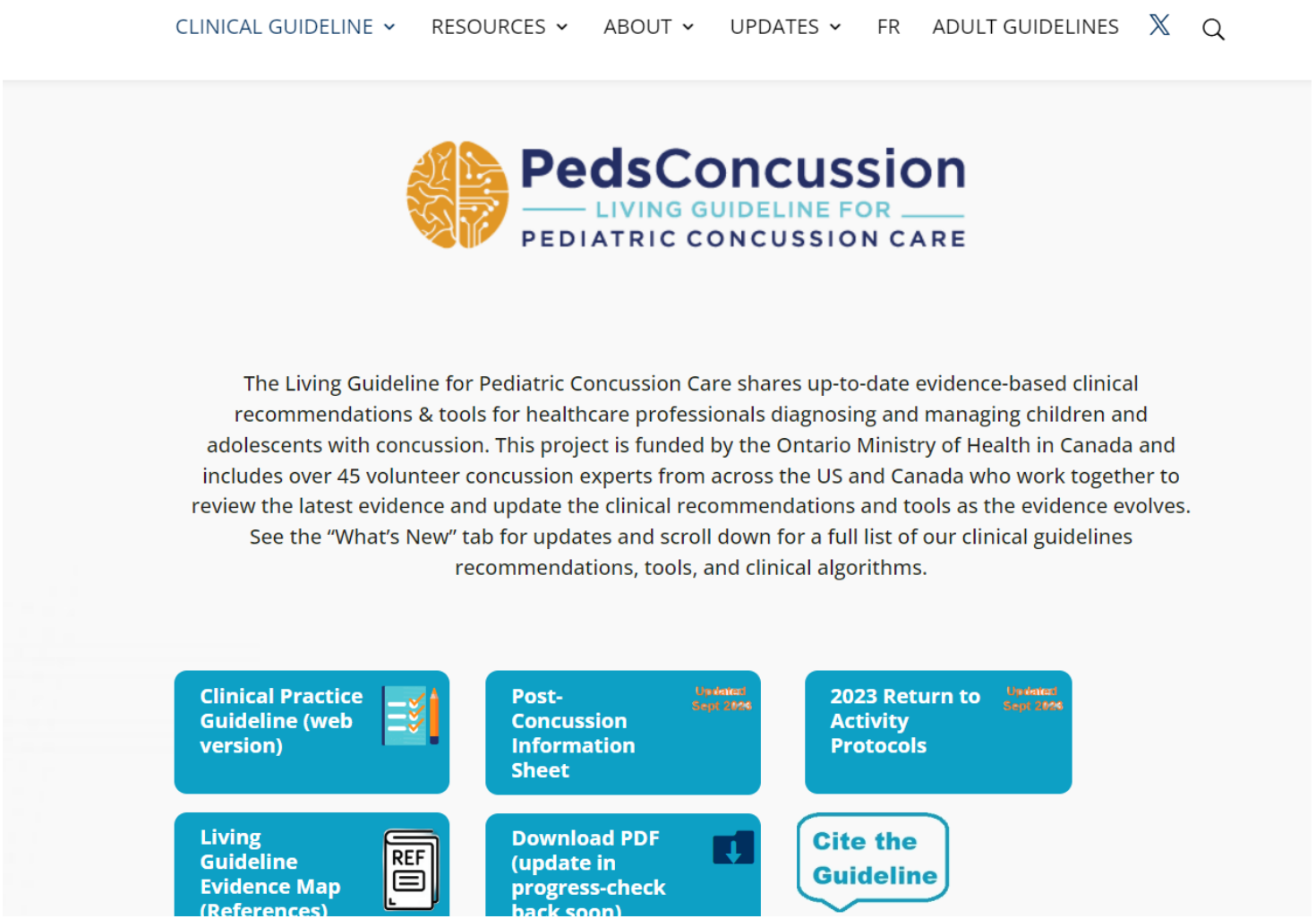
LIVING CONCUSSION GUIDELINES



Living Concussion Guidelines for Adults:

https://concussionsontario.org/

LIVING CONCUSSION GUIDELINES



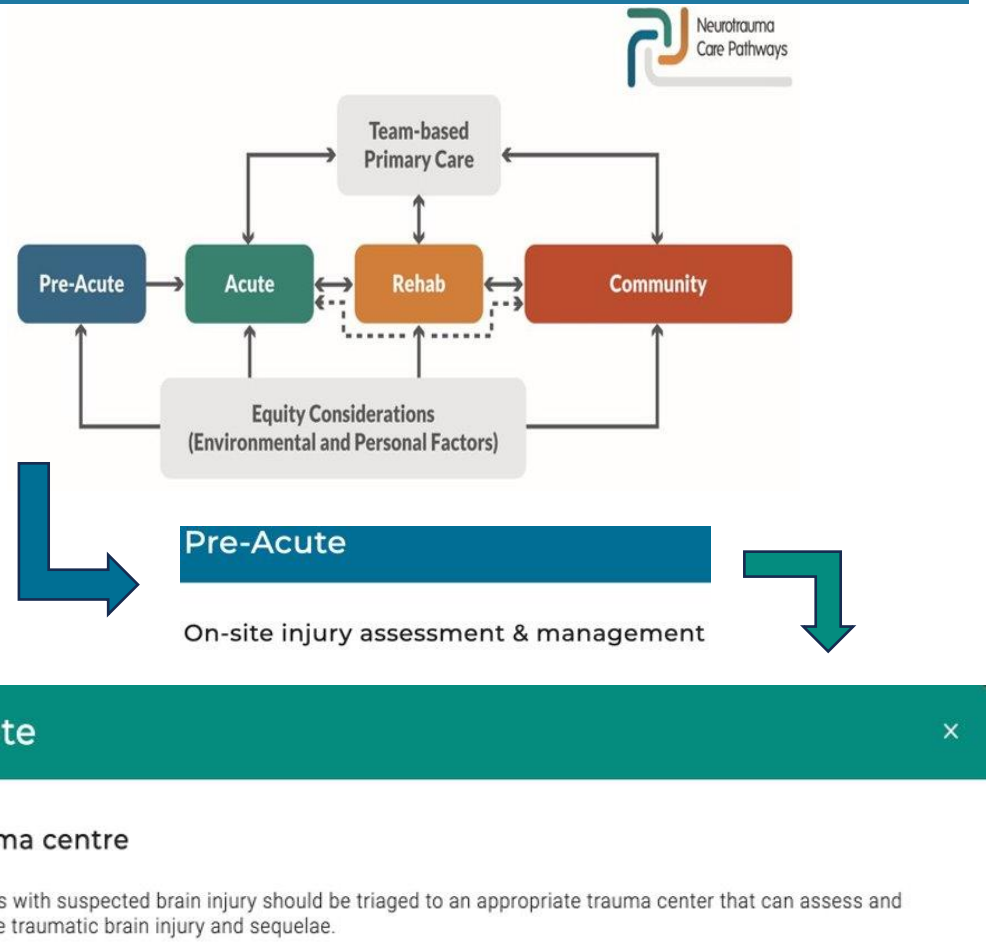
Pediatric Concussion Guideline:

https://pedsconcussion.com/

PATIENT PROFILE - LISA

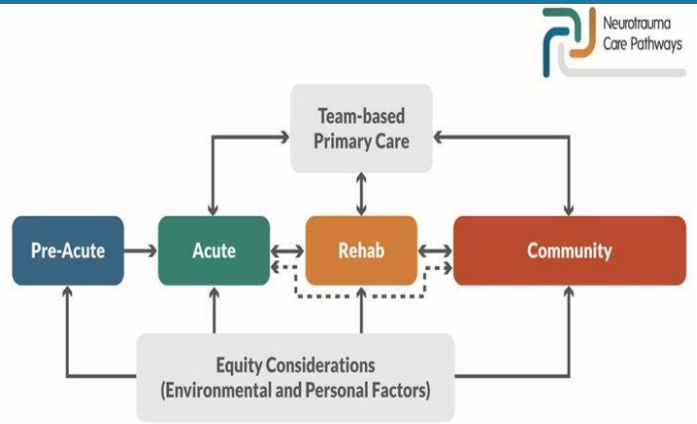
Patient Profile

- **Name:** Lisa
- **Age:** 30
- **Family:** married with no kids
- **Injury Mechanism:** skiing accident resulting in a severe TBI



PATIENT PROFILE - LISA

- 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



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H - Comprehensive Assessment of the Person with TBI

H.1.2 C

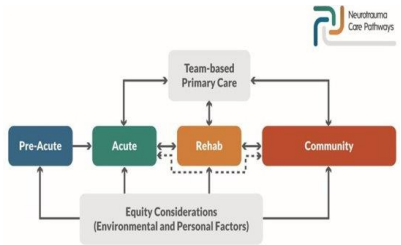
The initial management of individuals with traumatic brain injury should be guided by clinical assessments and protocols based on the Glasgow Coma Scale (GCS) score or the FOUR Scale score.

- Pathways for Assessment and Management of Patients in Post Traumatic Amnesia

INPATIENT REHAB

Inpatient Rehab

- Seen by multi-disciplinary team
- PT assessment includes ROM, Tone, Berg Balance Scale, gait speed, FIM
- Lisa's goals are to go home ASAP, have better balance so she can run and get her hand working better so she can type and get back to cooking, baking and playing piano



Interprofessional Specialized Rehab

Specialized inpatient

CANADIAN
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H.1.6 N C

All individuals with traumatic brain injury should have their physical functioning evaluated using both standardized and non-standardized assessments by a member of the interdisciplinary team including:

- **Physiotherapist: to assess sensation, coordination, balance, tone, strength, range of motion and mobility.**

» A. Key Components of TBI Rehabilitation

» A.1. Principles for Organizing Rehabilitation Services

Recommendations

A.1.12 F C

In order to support the continuous quality improvement of their services, TBI rehabilitation programs should monitor key performance and outcome indicators including but not limited to:

- **Number of days from injury to start of rehab**
- **Length of stay in rehabilitation**
- **Number and Intensity of services**
- **Measures of functional change progression (ex. Functional Independence Measure (FIM), Functional Assessment Measure (FAM), Disability Rating Scale (DRS), Mayo-Portland Adaptability Index (MPAI4), Coma Recovery Scale Revised (CRS-R), Glasgow Outcome Scale-Extended (GOS-E); not all apply to inpatients)**
- **Discharge disposition (return to home, level of services required, etc.)**
- **Activity and participation outcome measures important to the patient- including return to school or work**
- **Quality of life**
- **Patient responses from Qualitative interview**

INPATIENT REHAB

Inpatient Physio Treatment

- Focus is on strengthening, high level balance training, selective movement of her left upper and lower extremity
- Lisa is easily distracted during therapy sessions and needs frequent redirection and change of activities to keep her engaged

J. Cognitive Functions

- 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

CANADIAN
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M. Motor Function and Control

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

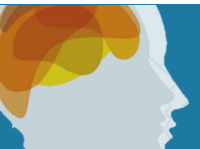
P Priority F Fundamental N New Level of Evidence A B C

M.1 - Motor Function and Control Assessment

- Recommendations

M.2 - Motor Function and Control Rehabilitation

- Recommendations

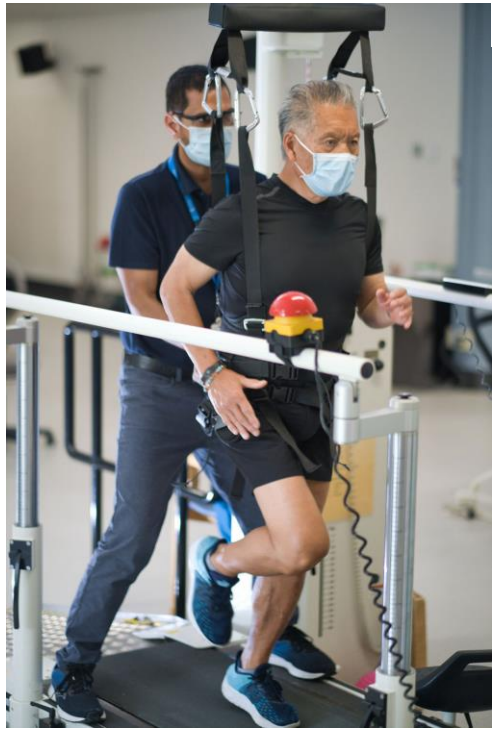


Canadian TBI Guideline

INPATIENT REHAB

Inpatient Physio treatment

- The PT has several BWST training sessions with Lisa where they are able to get her running on the treadmill.
- She is discharged home after 6 weeks of rehab and is referred to outpatient physiotherapy services



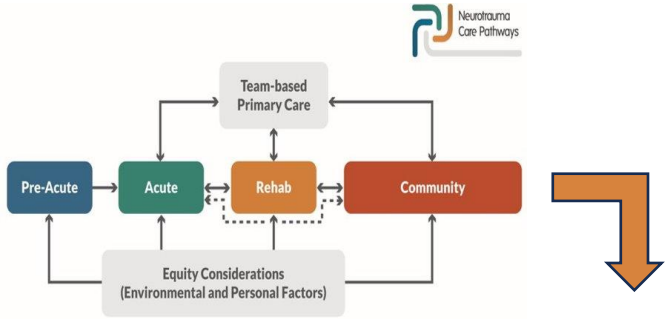
CANADIAN
CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI

M.2 - Motor Function and Control Rehabilitation

Recommendations

M.2.19 P A

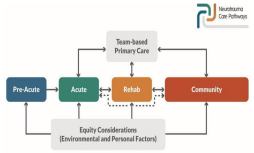
Exercise training is recommended to promote cardiorespiratory fitness in individuals with traumatic brain injury.



Interprofessional Specialized Rehab

Specialized outpatient

OUTPATIENT REHAB



Interprofessional Specialized Rehab

Specialized outpatient

Outpatient Physiotherapy

- Now independently ambulatory, with some balance deficits and reduced stamina
- Some fine motor control deficits in left hand
- Outpatient physiotherapy is focused on high level balance training, gait retraining, cardio & strengthening & fine motor exercises that mimic her job requirements

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

M.2 - Motor Function and Control Rehabilitation

▸ Recommendations

M.2.4 B

Training for strength and endurance with the person with traumatic brain injury should be performed, within the context of functional tasks when possible.

M.2.9 P A

A virtual-reality-based balance retraining program or a conventional balance retraining program can be used to improve balance post-traumatic brain injury.

M.2.10 C

Gait re-education is recommended to improve mobility after traumatic brain injury.
(Adapted from ABIKUS 2007, G54, p. 24)

M.2.13 P B

Functional fine motor control retraining activities should be considered to improve fine motor coordination after traumatic brain injury.
(Adapted from AOTA 2009, p. 82)

M.2.19 P A

Exercise training is recommended to promote cardiorespiratory fitness in individuals with traumatic brain injury.

OUTPATIENT REHAB

Outpatient Physiotherapy

- Lisa wants to return to running so the PT addresses this goal with the BWST and is gradually able to work on running some overground intervals independently.

- The PT also encourages Lisa to try Yoga classes in her community to help with her balance, mobility and strength. She suggests starting with Love Your Brain Yoga.

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

D. Promoting Reintegration and Participation

D.4 - Leisure and Recreation

Recommendations

D.4.4 N B

Guided exercise programs that incorporate aerobic activity, strengthening, and functional balance should be offered to persons with TBI upon medical clearance, in consultation with their physician or physical therapist. These could be home-based, provided virtually/through telerehab, or in the community. Depending on the person with TBI, offers for exercise programs should be made multiple times throughout the continuum of care.

NOTE: The intensity of such programs should not be so high that it interferes with a patient's ability to perform day-to-day responsibilities.

OUTPATIENT REHAB

Outpatient Physiotherapy

- After 3 months of outpatient PT, Lisa reports that she has tried reading books again and is finding it challenging. She has trouble remembering what she read & she has a headache after 20 min of reading.

- PT does a visual screen and notices difficulty with horizontal saccades and a reduced near point of convergence
- A referral is made to neuro-optometry who prescribes new glasses that Lisa reports make reading much better

J. Cognitive Functions

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

- 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

N. Sensory Impairment

N.1 - Vision Assessment

Recommendations

N.2 - Management of Vision Impairment

Recommendations

P. Pain and Headaches

P.1 - Assessment of Pain and Headaches

Recommendations

P.2 - Management of Pain and Headaches

Recommendations

EARLY REHABILITATION

Treatment

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

» R.12. Family Education in Neurobehavioral Issues

Recommendations

R.12.1 C

The support network of an individual with traumatic brain injury should receive written information about the potential causes of behavioural and emotional disorders after traumatic brain injury, possible antecedents and triggers, appropriate behavioural and emotional management strategies, and possible medication side effects. The individual's support network should also be invited to provide feedback and behavioural data.

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

» O.2. Management of Fatigue and Sleep

Recommendations

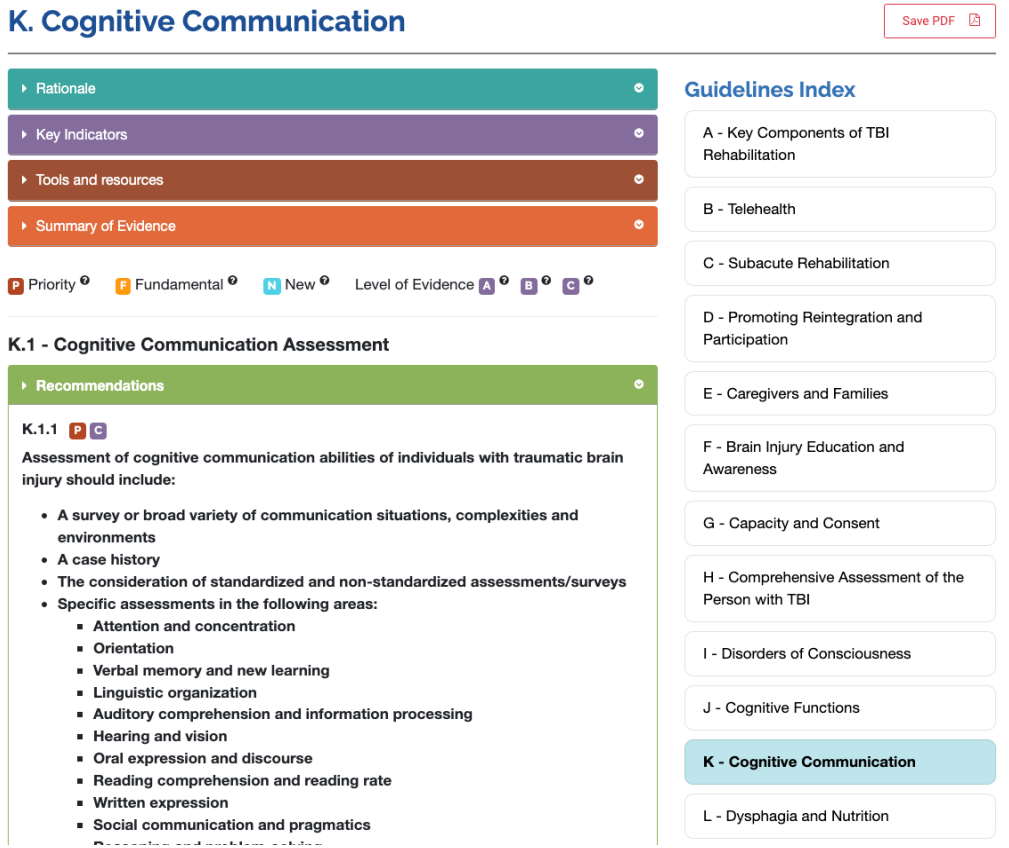
O.2.1 P B

Non-pharmacological interventions should be considered in the treatment of fatigue and sleep disorders for individuals with traumatic brain injury prior to initiating pharmacological interventions. Interventions may include: cognitive behavioural therapy (CBT) [for insomnia], light therapy, regular exercise, energy conservation strategies and sleep hygiene.

COGNITIVE COMMUNICATION

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).



COGNITIVE COMMUNICATION

Treatment

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

- Pathways for Management of Cognitive Communication and Social Cognition

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

K. Cognitive Communication

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

COGNITIVE FUNCTIONS

Treatment

- Commences use of her iPhone to address **memory issues**
- Lisa is taught some internal strategies for memory in her own environment
- Discuss medication options with physiatry

- Pathways for Management of Memory

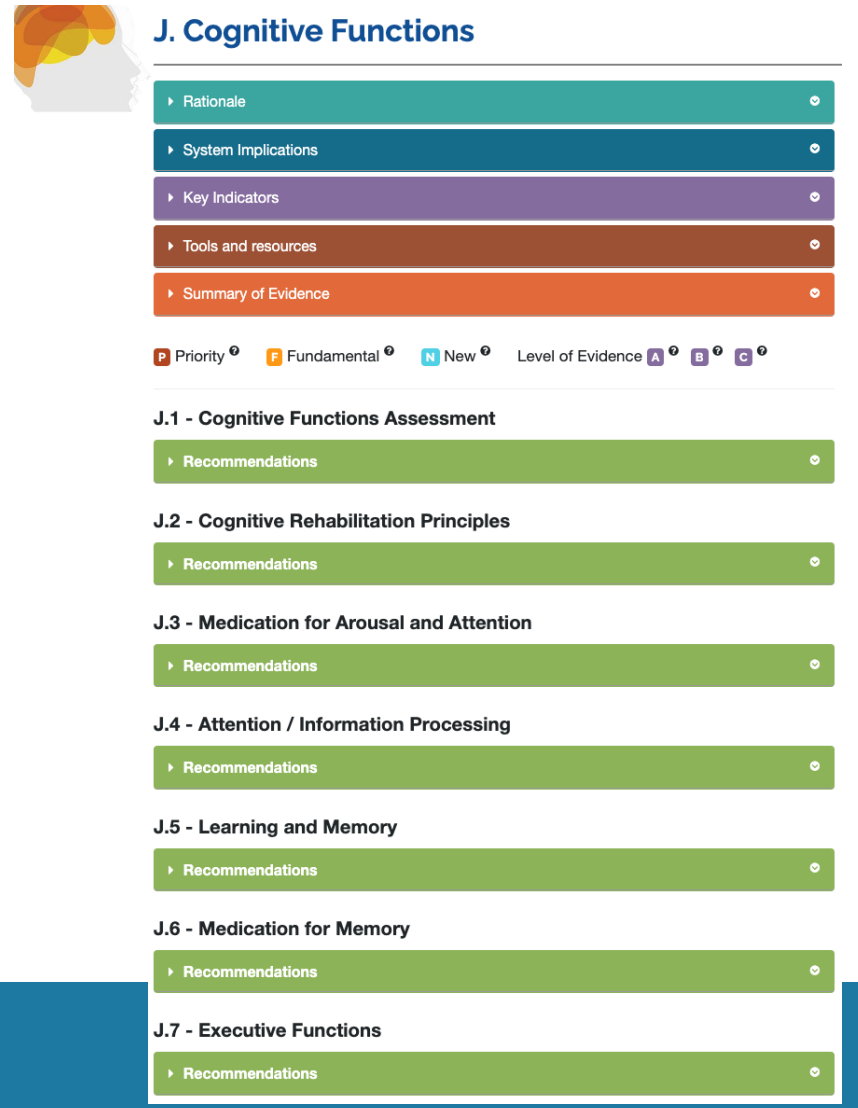
CANADIAN
CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS
WITH MODERATE TO SEVERE TBI

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

COGNITIVE FUNCTIONS

- Husband notices some ongoing irritability and memory impairment
- Lisa is working with OT & SLP and her PT incorporates some cognitive challenges during therapy sessions
- The team thinks Lisa is ready for a driving assessment and she is successful in passing and getting her license back



RETURN TO WORK

Return to Work

- As her abilities improve and now that she is able to drive herself, the team starts to plan for return to work.
- Very supportive employer who is willing to take her back
- Her outpatient team develops a graded return to work plan with periodic reevaluations and the ability to adjust the plan as required

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

D. Promoting Reintegration and Participation

D.5 - Driving

▸ Recommendations

D.6 - Vocational / Educational Rehabilitation

▸ Recommendations

RETURN TO WORK

Return to Work

- Prior to starting her return to work plan, the team has Lisa getting on a consistent sleep/wake cycle, practice commuting and continue to practice the cognitive and physical skills she will need to use at work
- Returns to work 8 months after injury as a lab technician
- Also, some adjustments are required from the original plan - she successfully returns to full time work over the next 6 months with some modified duties due to her decreased fine motor control

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

D. Promoting Reintegration and Participation

D.6.2 C

Vocational rehabilitation interventions should be offered to persons with TBI who require support and training to assist their return to work or to school, or for entering the workforce for those not previously employed. Vocational rehabilitation should include: cognitive, communicative, physical and behavioural strategies, work simulation activities, employer education, and on-site training. Interventions should include training and education about the specific needs of persons with TBI for people who are naturally present in the educational or vocational environment of the person with TBI.

PATIENT PROFILE - LISA

Problems illustrated by Lisa's Case:

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

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

Section 2 - Assessment and Rehabilitation of Brain Injury Sequelae

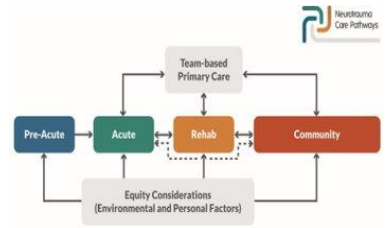
- H - Comprehensive Assessment of the Person with TBI
- I - Disorders of Consciousness
- J - Cognitive Functions
- K - Cognitive Communication
- L - Dysphagia and Nutrition
- M - Motor Function and Control
- N - Sensory Impairment
- O - Fatigue and Sleep Disorders
- P - Pain and Headaches
- Q - Psychosocial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

PATIENT PROFILE – LISA (PART 2)

Lisa is seen again 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**

- 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

RETURN TO EXERCISE

Treatment

- PT completes an assessment to guide Lisa's return to exercise plan.
- PT encourages Lisa to talk to her MD about reviewing her medication for weight gain side effects
- Lisa's PT takes her to the gym to create a program, and has a rehab therapist accompany Lisa to the gym for several visits to help Lisa gets into a routine that she can follow independently

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

D. Promoting Reintegration and Participation

D.4 - Leisure and Recreation

▸ Recommendations

D.4.4 N B

Guided exercise programs that incorporate aerobic activity, strengthening, and functional balance should be offered to persons with TBI upon medical clearance, in consultation with their physician or physical therapist. These could be home-based, provided virtually/through telerehab, or in the community. Depending on the person with TBI, offers for exercise programs should be made multiple times throughout the continuum of care.

RETURN TO ACTIVITY

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

- Lisa wants to participate in an activity that is more social and has some friendly competition
- The PT helps Lisa brainstorm possible activities that she can participate in: they consider rock climbing, bowling, pickleball but decide to try Frisbee golf
- The PT does some research to determine where Lisa can play and during treatment sessions, practices throwing a frisbee.
- She has the rehab therapist attend the course with Lisa and her husband help the transition to playing independently

D. Promoting Reintegration and Participation

D.4 - Leisure and Recreation

Recommendations

D.4.1 C

All persons with traumatic brain injury (TBI) should be assessed by a rehabilitation professional or team regarding leisure activities. Assessments should include identification of:

- **Their pre-injury level of participation in leisure/meaningful activities**
- **The barriers that could inhibit their engagement**
- **Opportunities to adapt and foster re-engagement in leisure/meaningful activities**
- **Their interest and ability to develop new leisure/meaningful activities**

(Adapted from INESSS-ONF, 2015)

NOTE: Activity participation should be continuously reassessed following TBI, especially after disruptions to the persons habits and routines have been observed.

D.4.2 P B

Persons with TBI who have difficulty undertaking leisure/meaningful activities of their choice should be offered a goal-directed community-based leisure education program aimed at increasing participation in leisure/meaningful and social activities.

(Adapted from INESSS-ONF, 2015)

D.4.3 N B

Barriers to engaging in leisure activities should be reduced by use of assistive technologies (such as social-assistive tech, persuasive assistive tech, personalized assistive tech, and planning assistive tech).

REFERENCE:

- Jamieson et al. (2019)

D.4.4 N B

Guided exercise programs that incorporate aerobic activity, strengthening, and functional balance should be offered to persons with TBI upon medical clearance, in consultation with their physician or physical therapist. These could be home-based, provided virtually/through telerehab, or in the community. Depending on the person with TBI, offers for exercise programs should be made multiple times throughout the continuum of care.

NOTE: The intensity of such programs should not be so high that it interferes with a patient's ability to perform day-to-day responsibilities.

PROMOTING REINTEGRATION

Behavioral Changes/Irritability

- Lisa and her husband have learned to avoid the busy malls
- However, they 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

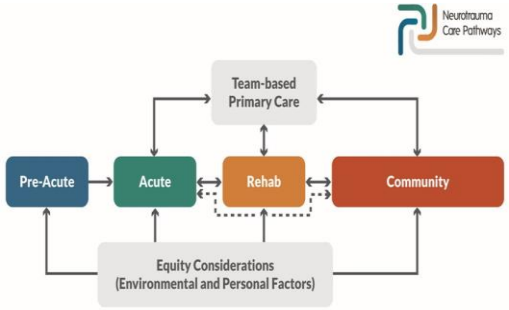
» D. Promoting Reintegration and Participation

» D.6. Vocational / Educational Rehabilitation

▸ Recommendations

RETURN TO WORK

- Avoids layoffs despite impairments
- Continues to require ongoing employment of techniques



Community

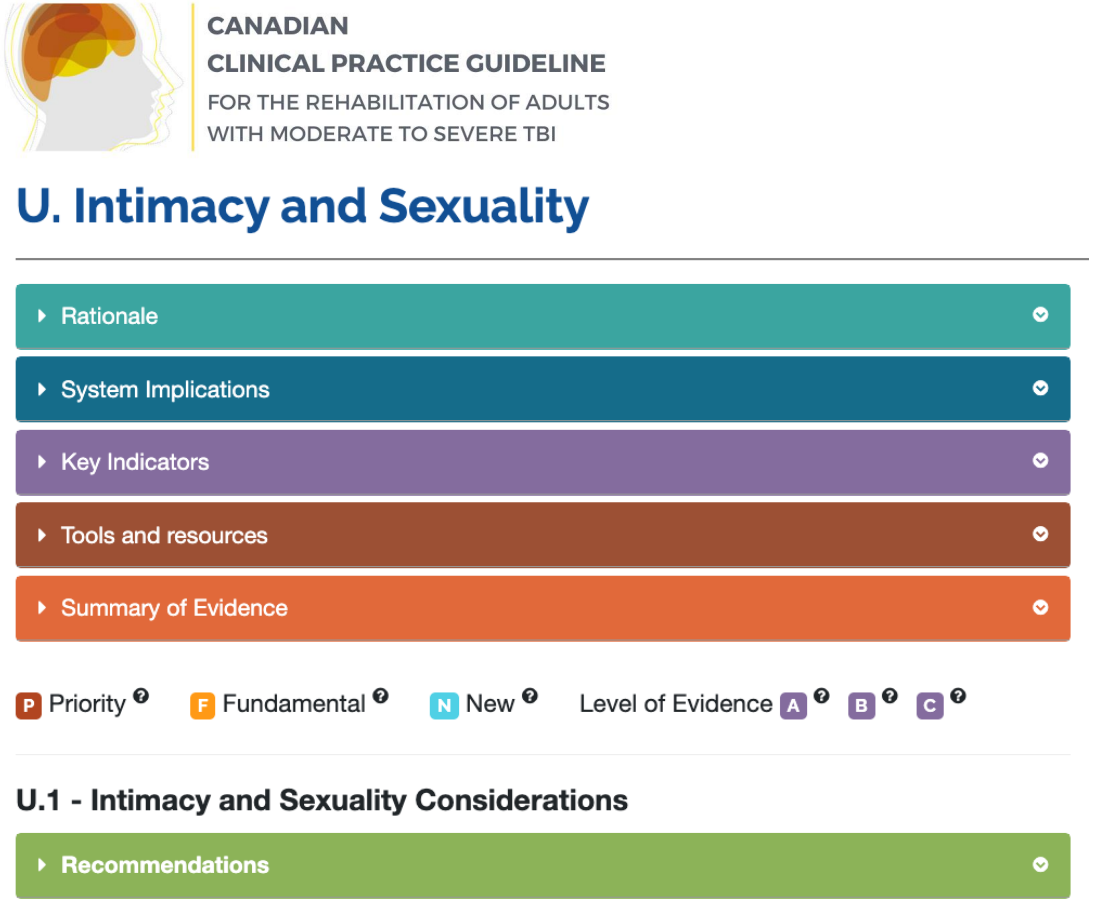
Activity re-integration & life roles: planning and support

Ongoing re-assessment & implementation of community supports

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

INTIMACY & SEXUALITY

- Now hoping to start a family but Lisa confesses to her PT that she is rarely sexually intimate with her husband because she does not have much of a sex drive since her injury and she feels insecure because of her weight gain and left hemiplegia, and it seems like he does not want to have sex with her anymore
- Her husband tells the PT privately he feels overwhelmed and doesn't know if they would be able to manage having a child.



INTIMACY & SEXUALITY

Intimacy & Sexuality

- The PT talks to Lisa about her concerns and with Lisa's consent, facilitates a referral to social work and talks to the physiatrist about any medication options to help with her libido
- They also discuss options for positioning during sex, nutritional choices to help with her weight loss goal and review her gym program.

U.1 - Intimacy and Sexuality Considerations

Recommendations

U.1.1 N C

Designated team members: Interprofessional teams should identify members of the team who will always initiate a discussion about intimacy and sexuality with the patient and their partner. The team member should be appropriately trained to initiate this discussion.

U.1.2 N C

Interprofessional training: All interprofessional team members should have a basic understanding and training on how brain injury can affect sexuality/intimacy. Clinicians should be provided with key phrases they can use to respond to patients and partners.

U.1.3 N C

Initiating conversation: If the patient/partner does not initiate a discussion about sexuality, then the clinician should seek permission to discuss sexuality and intimacy with the partner present, as appropriate, taking into consideration potential cultural factors.

U.1.4 N C

Individualizing intervention and education: Intervention and education about sexuality in individuals with traumatic brain injury should consider cultural identity, gender, age, sex, sexual orientation and gender identity.

U.1.5 N C

Written educational materials: Patients and their partners should be provided with written materials, at a minimum, regarding sexuality, relationships, and intimacy early during inpatient and/or outpatient rehabilitation and should provide patients with the opportunity to discuss and ask questions when they feel ready.

U.1.6 N C

For the person with TBI who is not currently in a romantic relationship but would like to be, provide training of skills that are likely to enhance their chances for success and safety.

U.1.7 N C

On follow-up with the person with TBI who is in a relationship, clinicians should explore if there has been a change in intimacy or sexual function and specifically inquire about changes in libido.

U.1.8 N C

If the person with TBI endorses changes in libido, then the clinicians should complete a medical workup including laboratory and endocrine workup to rule out a medical cause of decreased libido and provide advice regarding other causes of sexual dysfunction.

U.1.9 N C

If the person with TBI does not endorse changes in libido but does endorse strains in their existing relationship with their partner, they should be referred for individual and couples counselling.

U.1.10 N C

If the person with TBI and their partner do not endorse severe strain or changes in libido, they should be considered for the Couples CARE (Caring and Relating with Empathy) program if they meet the inclusion criteria.

KEY TAKEAWAYS

- **Evidence-based** Care Pathways and Living Clinical Practice Guidelines and companion resources are easily accessible
- Importance of timely comprehensive individualized assessment with validated evidence-based tools
- Value of providing **education to patients (and families)** above symptom management, treatment and prognosis
- **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; it is critical that **primary care be engaged** (where possible)

Neurotrauma Care Pathways

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

ONTARIO PHYSIOTHERAPY ASSOCIATION

THANK YOU

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Neurotrauma Care Pathways

UHN Toronto Rehabilitation Institute
The KITE Research Institute

PedsConcussion
LIVING GUIDELINE FOR PEDIATRIC CONCUSSION CARE

LIVING CONCUSSION GUIDELINES

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

Ontario Ministry of Health & Long Term Care