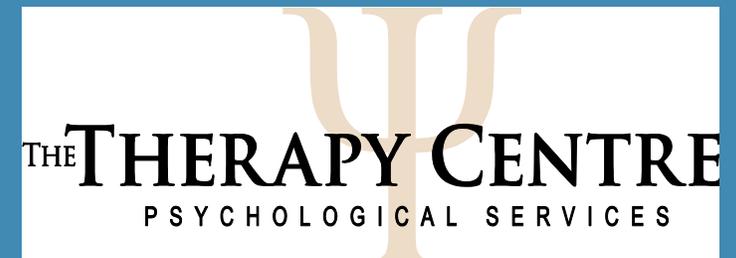


CONCUSSION: THE ROLE OF NEUROPSYCHOLOGY

Dr. Melanie Cochrane, Ph.D., C. Psych

April 29, 2021

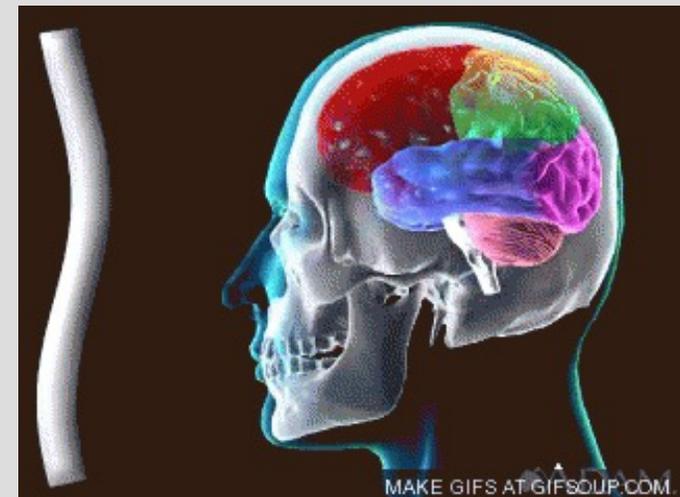


OVERVIEW

1. What is a Concussion/Mild Traumatic Brain Injury?
2. Conceptualization of Concussion
3. Predictors of Clinical Recovery
4. Concussion Treatment
5. The Role of Neuropsychology
6. Neuropsychological Assessment and Implications for Concussion
7. Questions & Discussion

WHAT IS A CONCUSSION/MILD TRAUMATIC BRAIN INJURY?

- Concussion/mTBI is caused by direct or indirect forces to the head (e.g., falls, motor vehicle accidents, assault, sports related injury) that causes your head and brain to move rapidly back and forth
- This can cause the brain to bounce around or twist in the skull, stretching and damaging the brain cells causing chemical changes in the brain
- Fortunately, the brain heals relatively well and recover



CONCUSSION/MTBI

- Neural-metabolic changes in the brain
- Pathophysiological changes, hours to days after initial injury
- Can take days-weeks to restore chemical balance in the brain
- Dynamic restoration in the brain occurs:
 - Some brain cells restore, some do not
 - Brain cells compensate, can create new neuronal connections
 - There are alterations in metabolism and function in the brain



CONCEPTUALIZATION OF CONCUSSION

- The brain heals relatively well!
- Typically takes a few days-weeks
- For small number of people a number of symptoms persist past the point of acute injury stabilization
- Common secondary symptoms of concussion can include:
 - Persistent headaches/migraines
 - Chronic pain
 - Sleep problems
 - Reduced energy, motivation, fatigue
 - Psychological stress, depression, anxiety
 - Vestibular injuries

PERSISTENT SYMPTOMS OF CONCUSSION

- A small minority of people continue to experience symptoms months up to years following concussion
- Persistent symptoms have been shown to be associated with high levels of disability, increased utilization of health care services, and lower health-related quality of life (McMahon et al. 2014; Vanderploeg et al. 2003; Voormolen et al. 2018)
- Often present with clusters of cognitive, affective, and somatic symptoms

Physical	Cognitive	Emotional
<ul style="list-style-type: none"> • Headache • Nausea • Balance Problems • Dizziness • Visual problems • Fatigue • Sensitivity to light • Sensitivity to noise • Move clumsily • Sleep problems 	<ul style="list-style-type: none"> • Feel mentally foggy • Feel slowed down • Difficulty concentrating • Difficulty remembering • Forgetful of recent information or conversations • Confused about recent events • Answers questions slowly • Repeats questions 	<ul style="list-style-type: none"> • Irritability • Sadness • Emotional lability • Nervousness

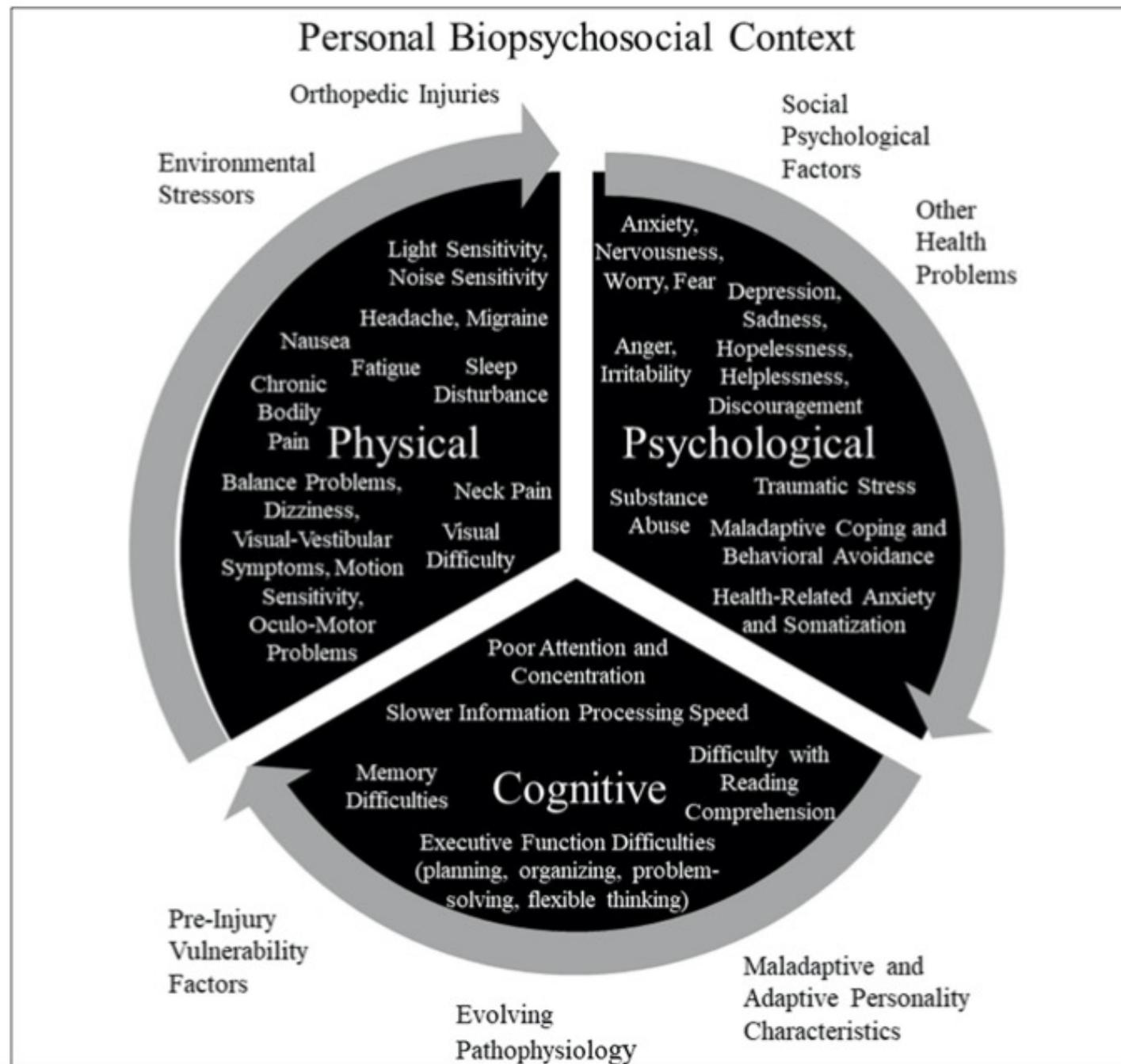


FIGURE 1 | Potentially Amplifying and Reinforcing Persistent Symptoms and Problems and Personal Biopsychosocial Context for Experiencing Persistent Symptoms

Iverson, G. L. (2019). Network analysis and precision rehabilitation for the post-concussion syndrome. *Frontiers in neurology*, 10, 489.

PREDICTORS OF CLINICAL RECOVERY

- For most people, cognitive deficits, balance, and other symptoms get better quickly
- Often individuals show rapid improvement over a few days
- A minority of individuals take much longer to recover
- Multiple underlying causes
- Predictor mediating variables:
 - Pre-injury factors
 - Injury severity characteristics
 - Post injury clinical factors

SLOWER RECOVERY: RISK FACTORS

- Slower recovery has been associated with:
 - Vestibular issues
 - Anxiety challenges
 - Stress, worry, depression
 - Chronic headaches/migraines
 - Chronic pain

TREATMENT

- Treat acute symptoms of concussion
- Then treat separate symptoms (e.g., headaches, chronic pain, emotional disturbances)
- Targeted evidence-based treatment approaches are essential
- Transdiagnostic approach to treatment:
 - Identifying baseline levels of functioning
 - Setting realistic and meaningful functional goals and slowly building tolerance and resiliency
 - Gradually returning to daily life
 - Important to be active and involved in rehabilitation – this promotes recovery
 - Prolonged rest is not optimal

WHAT IS A NEUROPSYCHOLOGIST?

- **Clinical Neuropsychology** is the application of knowledge about brain-behaviour relationships to the assessment, diagnosis and treatment of individuals with known or suspected central nervous system dysfunction (CPO)
- A Clinical Neuropsychologist is a health care professional who specializes in the assessment of individuals with cognitive, behavioural, or emotional difficulties related to impaired brain functioning

WHY SEE A NEUROPSYCHOLOGIST?

- Can provide an individualized comprehensive Neuropsychological Assessment geared specifically toward your presenting concerns/referral questions
- Understands pre-injury characteristics, understands the nature and severity of the injury, considering bio-psycho-social factors, including perpetuating factors
- Can provide customized treatment and a personal rehabilitation plan for your personal needs

WHAT IS A NEUROPSYCHOLOGICAL ASSESSMENT?

- A comprehensive and specialized form of assessment which is conducted by a registered psychologist who has specific training in clinical neuropsychology.
- To determine or look at what changes may have occurred since the brain injury & evaluate the functioning of the brain
- Neurocognitive testing looking at areas of
 - Intellectual ability
 - Attention
 - Processing speed
 - Learning and Memory
 - Executive functions
 - Emotional and behavioral functioning
 - Personality

WHAT ARE THE BENEFITS?

- Confirm or clarify a diagnosis.
- Provide a personalized profile of your strengths and weaknesses.
- Guide rehabilitation, education, vocational, recommendations for cognitive intervention.
- Provide individualized treatment recommendations.
- Document changes in functioning and ability.
- Provide targeted referrals to other healthcare providers such as physiotherapists, occupational therapists, neurologists, psychologists, psychiatrists, social workers, dieticians, and others.
- Are there any risks?

WHAT CAN I EXPECT IF I COMPLETE AN ASSESSMENT?

Intake Interview

- 90-minute initial intake interview with client (and a family member or friend, where available).
- This will include discussion and understanding of the presenting concerns
- Review and discussion of initial referral question

WHAT CAN I EXPECT IF I COMPLETE AN ASSESSMENT?

Standardized Testing

- A separate testing session will be scheduled
- Can include paper-and pencil and computerized tests looking at your thinking abilities such as:
 - Intelligence
 - Attention
 - Learning, & memory
 - Language
 - Executive functions
 - Visual-perceptual functioning
- You will also be asked to complete questionnaires of mood, anxiety, and personality.
- Collateral reports (e.g., a family member/friend/caregiver may also complete questionnaires)
- Testing can take anywhere from 3 hours for a brief screening, up to 8 hours for a more comprehensive assessment.

WHAT CAN I EXPECT IF I COMPLETE AN ASSESSMENT?

- *Feedback and Recommendations*
 - Feedback session will involve meeting together for a 60-minute appointment to discuss the results of the assessment
 - You will be able to ask any questions and discuss what steps you might take going forward
 - This is individualized to meet your needs and personal goals

HOW ARE THE TEST RESULTS USED?

- Confirm or clarify a diagnosis
- Provide a profile of strengths and weaknesses
- Guide rehabilitation, education, vocational, recommendations for cognitive intervention
- Document changes in functioning since prior examinations
- Clarify what compensatory strategies would help in daily life
- Result in referrals to other specialists, such as occupational therapists, physical therapists, neurologists, psychologists, psychiatrists, social workers, dieticians, and others

SOME OF THE QUESTIONS THAT MAY BE ANSWERED:

- **Questions about diagnosis**
 - Did I suffer from a brain injury after my accident?
 - What can I expect with recovery from my brain injury?
- **Questions about daily function**
 - Am I ready to go back to work?
 - How can I better concentrate on my day to day activities?
- **Questions about treatment**
 - Could I benefit from psychotherapy or cognitive rehabilitation?
 - Should I be referred to a medical doctor for medications or other tests?
- **Questions about emotional functioning**
 - Determining whether you may be struggling with depression and/or anxiety problems since your brain injury
 - Determining the impact of brain injury on emotional functioning and personality

RECOMMENDATIONS FROM A NEUROPSYCHOLOGICAL ASSESSMENT

What if I need Treatment Following My Assessment?

- Recommendations following a neuropsychological or cognitive assessment may include:
 - Developing cognitive compensatory strategies that fit with the individual's strengths and weaknesses
 - Developing memory aids and strategies to support attentional problems
 - Brain Injury/ Concussion Management
 - Cognitive Behavioural Therapy
 - Functional approach to managing cognitive concerns

FEES FOR ASSESSMENT

- The fees for the assessment will vary depending the complexity and length
- Based on a discussion with the referral source (e.g., medical doctor, psychiatrist, neurologist, social worker, occupational therapist, physiotherapist), costs for the assessment will be determined ahead of time
- This will be discussed with the client prior to consenting to participate in the assessment
- The client will be advised to contact their insurance company to determine their level of coverage, and decide whether they wish to proceed with the assessment

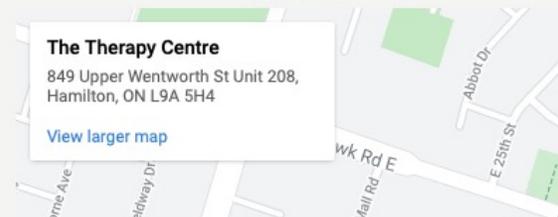
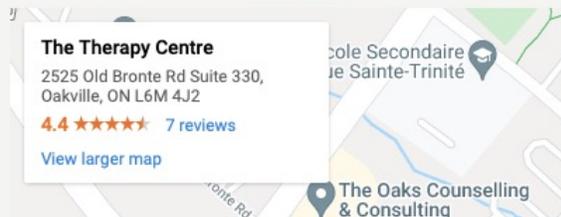
HOW DO I SCHEDULE AN APPOINTMENT?

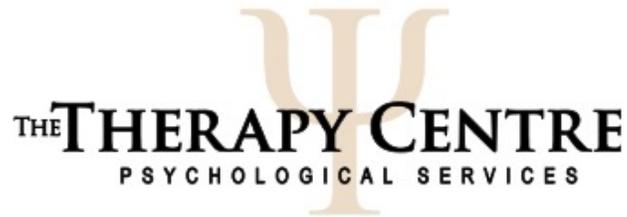
- Speak to your family doctor about a referral to see a clinical neuropsychologist
- This can be done on the community (e.g., in private practice) or within a hospital based program (e.g., Neuropsychological Outpatient Programs)
- Check with your own doctor as this varies based on jurisdiction

IF LOCATED IN GREATER TORONTO AREA/OAKVILLE ONTARIO:

The Therapy Centre

<https://thetherapycentre.ca/assessments/neuropsychological-assessments/>





NEUROPSYCHOLOGY ASSESSMENT SERVICE

What is a Neuropsychological Assessment?

- A comprehensive and specialized form of assessment which is conducted by a registered psychologist who has specific training in clinical neuropsychology.

What Types of Conditions do we Assess?

- Cognitive Impairments (e.g., impairments in attention, processing speed, memory)
- Brain Injury (Concussion/Traumatic Brain Injury/ Acquired Brain Injury)

Neuropsychological Assessment Information Sheet

What is a Clinical Neuropsychologist?

A Clinical Neuropsychologist is a health care professional who specializes in the assessment of individuals with cognitive, behavioural, or emotional difficulties related to impaired brain functioning.

What is a Neuropsychological Assessment?

A neuropsychological assessment is a specialized form of assessment, conducted by a registered psychologist who has specific training in clinical neuropsychology.

What Conditions do we Assess?

- Cognitive Impairments (e.g., impairments in attention, processing speed, memory)
- Dementia (e.g., Alzheimer's Disease)
- Mild Cognitive Impairment
- Brain Injury (Concussion/Traumatic Brain Injury/ Acquired Brain Injury)

Neuropsychological Assessment Intake Referral Form

Please fax/email referral and related documents to:

FAX: (289) 291-0207

EMAIL: info@thetherapycentre.ca

You can also call our office directly and complete the referral by **PHONE: (289) 291-0205.**

Client Information:

Name of Client (Last Name/ First Name):

Date of Birth (dd/mm/yyyy):

Gender:

Address:

Email:

Telephone:

THE THERAPY CENTRE

- Please find our referral form on our website: <https://thetherapycentre.ca>

The screenshot displays the website for The Therapy Centre Psychological Services. At the top center is the logo, which features a large gold Greek letter Psi (Ψ) above the text "THE THERAPY CENTRE" and "PSYCHOLOGICAL SERVICES" in a smaller, dark font. Below the logo is a horizontal navigation menu with the following items: HOME, ABOUT US (with a dropdown arrow), OUR TEAM (with a dropdown arrow), ABOUT CBT & EFT (with a dropdown arrow), SERVICES (with a dropdown arrow), FORMS, BLOG, and CONTACT US. Below the navigation menu is a large, light-colored rectangular area containing contact information for two locations. On the left is the Oakville location, and on the right is the Hamilton location. Each location's name is in a large, bold font, followed by its address, city, and phone number. The Oakville address is 2525 Old Bronte Rd, Suite 330, Oakville, ON L6M 4J2, with a phone number of (289) 291-0205. The Hamilton address is 849 Upper Wentworth St. Suite 208, Hamilton, ON L9A 5H4, with a phone number of (289) 291-0206. The logo is repeated in a smaller size above the contact information for each location.

Oakville
2525 Old Bronte Rd, Suite 330
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Tel: (289) 291-0205

Hamilton
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RESOURCES

The Therapy Centre:

- <https://thetherapycentre.ca/assessments/neuropsychological-assessments/>

Websites:

College of Psychologists of Ontario

- <https://cpo.on.ca>

Ontario Neurotrauma Foundation

- <https://onf.org>

Ontario Brain Injury Society

<https://obia.ca/>

Brain Injury Association of America

- <https://www.biausa.org>

THANK YOU!