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IS THE PROBLEM
OF CHRONIC PAIN
POSSIBLY AN
ACQUIRED BRAIN
INJURY THAT
HAS BEEN
MISSED?

Toronto ABI
 Network
 Conference 2020
 November 12-13

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- Dip.PT 1966 McGill
- B.Sc.PT 1967 McGill
- M.Sc.PT 2002 Western
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LearningObjective- 1(One)

 To understand how trauma to the cervical spine

and

complaints of headache and

dizziness

can mimic

 concurrent postconcussion symptoms.

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Learning Objective2 (Two)

 To differentiate and list potential reasons for delayed recovery post trauma and be able to apply a systems framework for working through variables affecting post-trauma recovery and rehabilitation.

• (Biopsychosocial factors- will not be discussed in detail)

LearningObjective- 3(Three)

- To apply a new vocabulary of descriptive words, other than PAIN
- to better describe sensations and symptoms experienced,
- to improve communication
 between patient and provider
- to delineate the various problems to better target appropriate interventions.

Melzack and Wall-Gate Control Theory of Pain

- Pain Mechanisms: A New Theory
 - Ronald Melzack, Patrick D. Wall
 - Science 19 Nov 1965: Vol. 150, Issue 3699, pp. 971-979

- The golden anniversary of Melzack and Wall's gate control theory of pain:
 Celebrating 50 years of pain research and management
 - Joel Katz, PhD and <u>Brittany N Rosenbloom</u>,
 - <u>Pain Res Manag</u>. 2015 Nov-Dec; 20(6): 285–286.

McGill Pain Questionaire

Short Form

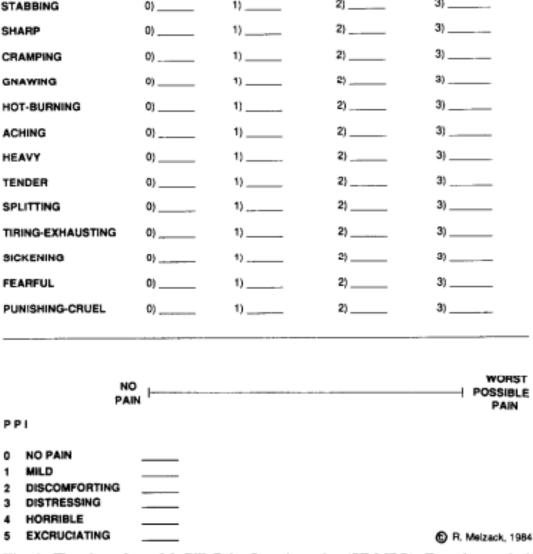
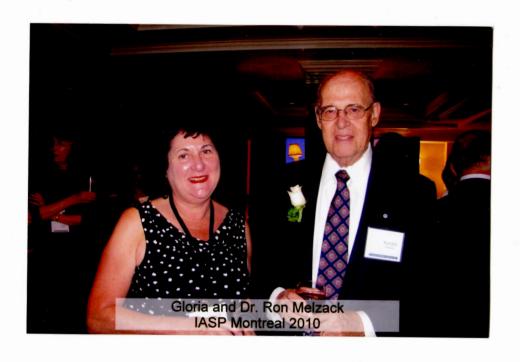


Fig. 1. The short-form McGill Pain Questionnaire (SF-MPQ). Descriptors 1-11 represent the sensory dimension of pain experience and 12-15 represent the affective dimension. Each descriptor is ranked on an intensity scale of 0 = none, 1 = mild, 2 = moderate, 3 = severe. The Present Pain Intensity (PPI) of the standard long-form McGill Pain Questionnaire (LF-MPQ) and the visual analogue (VAS) are also included to provide overall intensity scores.

Montreal 2010 IASP

- Gloria Gilbert
- Ron Melzack



IASP Definition of Pain-1979

"An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"

IASP Definition of Pain2020

"An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage,"

IASP 2020: 6 key notes added

1. pain is always a personal experience (biopsychosocial factors)

2. pain and nociception are different phenomena

3. individuals learn concept of pain through their life experiences

4. a person's report of pain should be respected

5. pain is not always adaptive and may have adverse effects on function as well as social and psychological well-being

6.inability to communicate (verbally) does not negate the possibility that a human or nonhuman animal experiences pain

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Chronic or Persistent Pain

Pain persisting beyond the expected healing time of an injury or an illness, usually considered beyond 6 months

(12 weeks often used post injury)

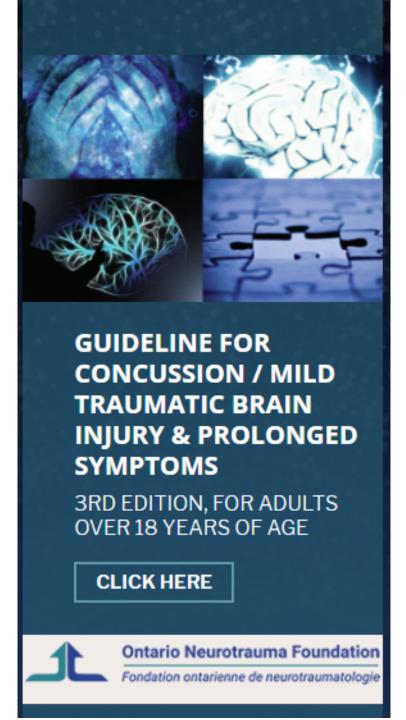


Table 4.1. Differential Diagnoses Related to Concussion/mTBI

Major depressive disorder

Generalized anxiety disorder

Post-traumatic stress disorder (PTSD)

Chronic pain syndrome

Cervical strain/whiplash associated disorder

Substance abuse or polypharmacy

Somatic symptom disorder

Factitious disorder

Malingering

Post-traumatic headache

Post-traumatic dizziness

Fibromyalgia syndrome (secondary)

Primary sleep disorder: e.g., obstructive sleep apnea

Table 1.1. Risk Factors Influencing Recovery Post mTBI

Medical Factors: Pre-existing/ concurrent medical conditions or post- injury symptoms that are associated with poor outcomes post mTBI	 History of previous traumatic brain injury History of previous physical limitations History of previous neurological or psychiatric problems Skull fracture Early onset of pain and in particular headache within 24 hours after injury Confounding effects of other health-related issues, e.g., pain medications, disabling effects of associated injuries, emotional distress Anxiety High number of symptoms reported early after injury i.e., high score on the Rivermead or Post Concussion Symptom Questionnaire Vestibular/vestibular-ocular abnormalities Pre-injury sleep disturbance or post-injury changes Reduced balance or dizziness Nausea after injury Memory problems after injury Post-traumatic amnesia (PTA)
Contextual Factors: Personal, psychosocial, or environmental factors that may negatively influence recovery post mTBI	 Injury sustained in a motor vehicle accident Potential influence of secondary gain issues related to litigation and compensation Not returning to work or significant delays in returning to work following the injury Being a student Presence of life stressors at the time of the injury Higher levels of symptom reporting is associated with mood symptoms and heightened self-awareness of deficits Older age Lack of social supports Lower education/low social economic status Female gender Lower Resiliance Returning to a contact/ risk of contact sport activity

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	Injury sustained in a motor vehicle accident

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Adapted from the Motor Accidents Authority of NSW, Guidelines for Mild Traumatic Brain Injury following a Closed Head Injury (MAA NSW, 2008)

WHIPLASH



NECK TRAUMA







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WHAT IS NECK TRAUMA?

- MVA (car, motorcycle, bus, pedestrian, scooter)
- Slip and fall
- Items/objects landing on head and neck
- Sports/Recreational Injuries

WHIPLASH DEFINITIONS

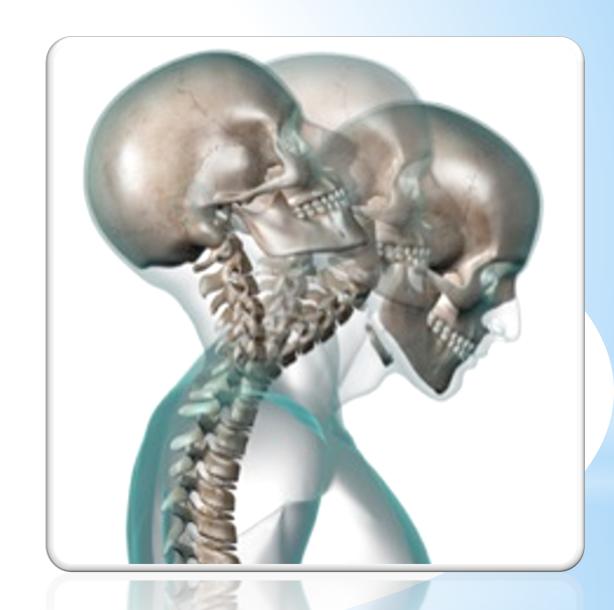
Original:
 Flexion/hyperextension
 Injury to the Neck

Current:
 Acceleration/Deceleration

 Injury

Definition of Whiplash (Barnsley, Lord & Bogduk, 1994)

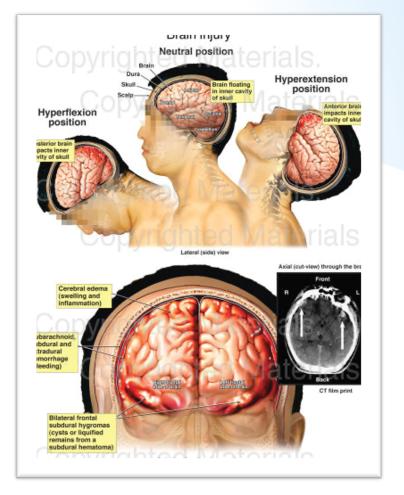
'an injury to 1 or more elements of the cervical spine that arises from inertial forces being applied to the head in the course of a MVA that results in perception of neck pain'



Muscles



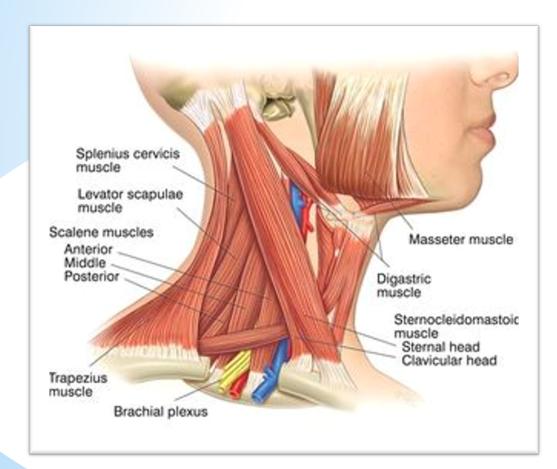
Brain

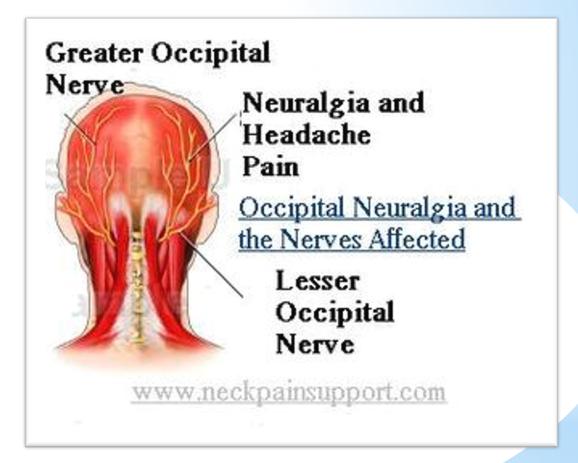


*Whiplash-Associated Disorders

Muscles

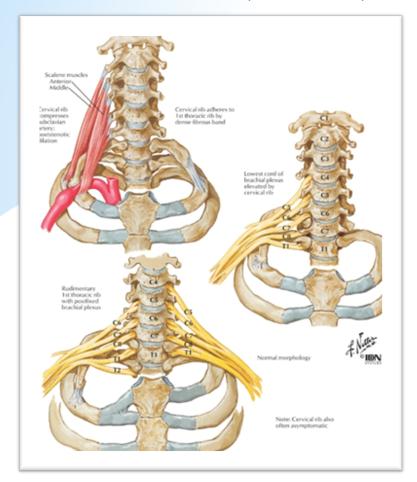
Nerves

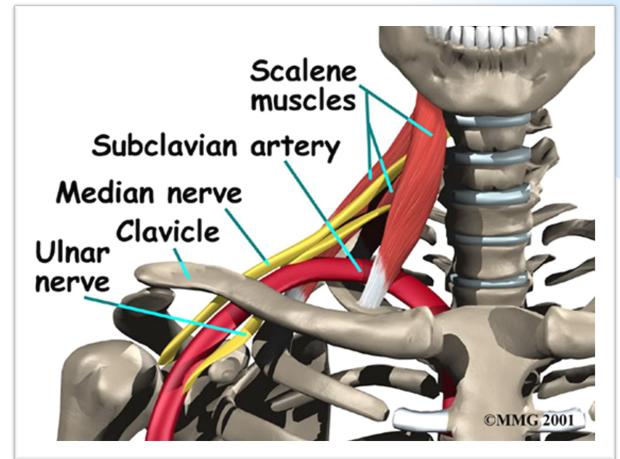




*Whiplash Associated Disorders

Bones, Discs, Muscles, Blood Vessels & Nerves





*Cervical Spine

*TRAUMATIC BRAIN INJURY

*Result of an external mechanical force applied to the cranium and the intra-cranial contents leading to temporary or permanent impairments, functional disability, or psychological maladjustment

*(Traumatic Brain Injury; Definition, Epidemiology, Pathophysiology: S.T. Dawodu et. al. web reference; http://emedicine.medscape.com/article/326510-overview)

*TRAUMATIC BRAIN INJURY

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Clinical Review: Whiplash Injury Barnsley, Lord & Bogduk. Pain 58 (1994) 283-307Studies more than 1 year (usually > 2)following trauma

Pain, 58 (1994) 283-307 Elsevier Science B.V.

PAIN 02613

Clinical Review

Whiplash injury ¹

Les Barnsley, Susan Lord and Nikolai Bogduk *

Cervical Spine Research Unit, Faculty of Medicine, The University of Newcastle, Callaghan, NSW 2308 (Australia)

(Received 20 December 1993, revision received 14 April 1994, accepted 15 April 1994)

Key words: Whiplash; Neck pain; Headache; Litigation; Pathophysiology

0 WHIPLASH INJURY: **CLINICAL REVIEW** Les Barnsley, Susan Lord and Nikolai Bogduk, Pain 58 (1994) 283-307

The most common sequelae of 'whiplash' (min. 2 yrs post-injury):

- 1. neck pain
- 2. headaches
- 3. visual disturbances
- 3. dizziness
- 4. disequilibrium (balance problems)
- 5. weakness (unexplained)
- 6. paraesthesia (numbness)
- 7. concentration and memory disturbances
- 8. psychological factors

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Published Articles

- Whiplash Injury or Concussion? A Possible Biomechanical Explanation for Concussion Symptoms in Some Individuals Following a Rear-End Collision
 - Benjamin S Elkin, James M Elliott, Gunter P Siegmund,
 - J Orthop Sports Phys Ther 2016;46(10):874-885.
- Cervical Injury Assessments for Concussion Evaluation: A Review
 - Kelly Cheever, MS, ATC,* Keisuke Kawata, PhD, ATC,† Ryan Tierney, PhD, ATC,* and Anne Galgon, PhD, PT‡
 - J Athl Train. 2016 Dec; 51(12): 1037–1044.

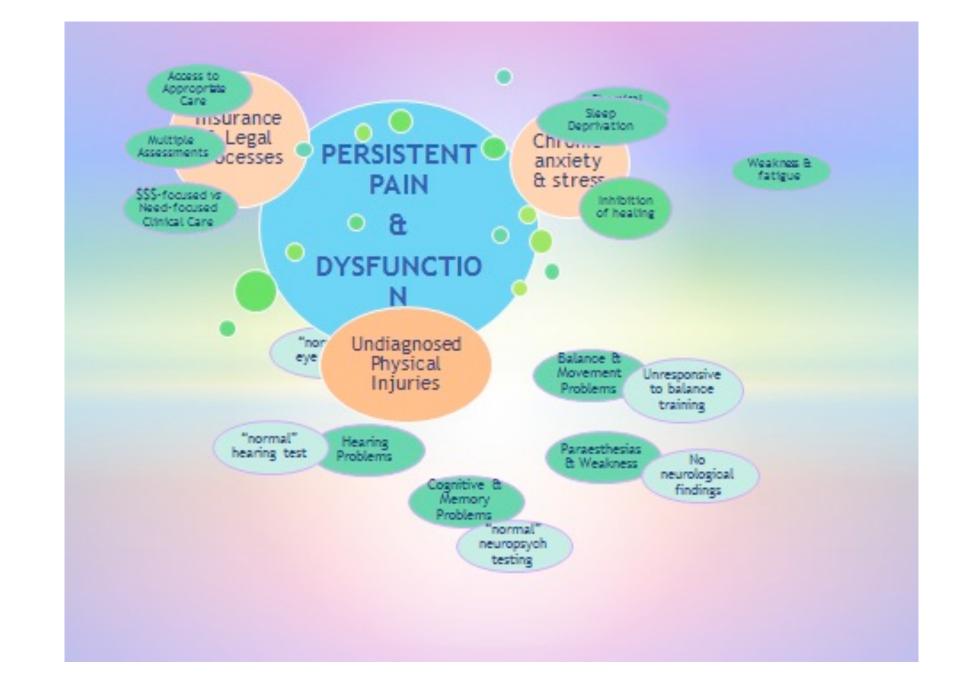
+ Published Articles

- Can the Neck Contribute to Persistent Symptoms Post Concussion? A Prospective Descriptive Case Series
 - Ewan Kennedy, Dusty Quinn, Cathy Chapple, Steve Tumilty;
 - J Orthop Sports Phys Ther 2019;49(11):845-854. Epub 1 Jun 2019.
- Concussion in Combination With Whiplash-Associated Disorder May Be Missed in Primary Care: Key Recommendations for Assessment and Management
 - Trudy Rebbeck, Kerrie Evans, James M Elliott
 - J Orthop Sports Phys Ther
 2019;49(11):819-828
 doi:10.2519/jospt.2019.8946.

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CHALLENGES IN IDENTIFICATION/DIAGNOSIS

- no report of loss of consciousness
- no direct head trauma
- independently mobile after traumatic event
- no standard follow-up of the trauma victim in the ER, hospital or medical clinic
- those who do present (hospital, clinic) may have inadequate documentation or no follow-up



Patient's view:



Physiotherapist's view:



PHYSIOTHERAPY ASSESSMENT

- 1. Be cautious of language- brain injury is 'scary'
- 2. Body Maps: head and neck- not standardized (cannot score)
- 3. Questionnaires: often use as part of history intake- not used to score



The word PAIN is used too

generically and

does not have

the same meaning

for everyone.

Re-Framing the Problem "Sensation" NOT "Pain"

Physical

Aching
Stabbing
Shooting
Burning
Etc. ad infinitum

Emotional

Anxious
Stressed out
Worried
Overwhelmed
Depressed
Etc. ad infinitum

Other

Dizzy/Light-headed
Headache- not in my neck
Sensitive to noise/
motion/light,
Unsteady/off balance
Clumsy
Blurred vision

0

Physical Words: What Do You Feel?

- Aching
- Stabbing
- Shooting
- Burning
- Etc. ad infinitum

0 Emotional Words: How Do You Feel?

- Anxious
- Stressed out
- Worried
- Overwhelmed
- Depressed
- Etc. ad infinitum

- + Other Words
- Used toDescribeHow You AreFeeling

?mTBI

- Dizziness
- Light-headed
- Headache- not in my neck
- Sensitive to noise, movement, light
- Unsteady, off balance
- Clumsy
- Blurred vision

Some ideas to consider

- Importance of taking detailed and relevant history challenging with some patients
- Often inadequate / poor assessment of trauma
- Documenting signs and symptoms often seen as a 'weakness' or 'complaining'
- Concern that extent of trauma(s) may impact job security, ability to access benefits (i.e. if dealing with MVA insurer

Name	Date
Front	Back
Left	Right

*Questionnaires

- 1. Head and Neck Maps
- 2. Berg Balance Scale
- 3. Dizziness Handicap Inventory
- 4. Rehabilitation Professional's Checklist
- 5. The Post Concussion Scale
- 6. The Rivermead Post-Concussion Scale

Appendix 1.6

Post Concussion Symptom Scale

Name:		_	I		:/D				Date of Injury:							_					
			No								-		_		Se		re"	6"			
SYMPTOMS	D	2210	/Hr											ssion		22.00	/Hr				
Headache	0	ays 1			4				ays 1	/Hı		4			0	ays 1			4		
	0	1			4			0		2	3	4			0	1	2	3	4	-	6
Nausea	0		_				-						_	-	0		_				
Vomiting	0	1	2	3			6	0		2	3	4		6	0	1	2	3	4	-	6
Balance problems	0	1	2	3			6	0	1	2	3	4		-	0	1	2	3	4		6
Dizziness	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Fatigue	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Trouble falling to sleep	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Excessive sleep	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Loss of sleep	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Light sensitivity	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Noise sensitivity	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Nervousness	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5		0	1	2	3	4	5		0	1	2	3	4	5	

0 1 2 3 4 5 6

0 1 2 3 4 5 6

0 1 2 3 4 5 6

0 1 2 3 4 5 6

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0 1 2 3 4 5 6

0 1 2 3 4 5 6

TOTAL SCORE

Visual problems

Numbness

Feeling "slow"

Feeling "foggy"

Difficulty concentrating

Difficulty remembering

Appendix 1.5

The Rivermead Post Concussion Symptoms Questionnaire*

After a head injury or accident some people experience symptoms which can cause worry or nuisance. We would like to know if you now suffer from any of the symptoms given below. As many of these symptoms occur normally, we would like you to compare yourself now with before the accident. For each one, please circle the number closest to your answer.

- 0 = Not experienced at all
- 1 = No more of a problem
- 2 = A mild problem
- 3 = A moderate problem
- 4 = A severe problem

Compared with before the accident, do you now (i.e., over the last 24 hours) suffer from:

Headaches	0	1	2	3	4
Feelings of dizziness	0	1	2	3	4
Nausea and/or vomiting	0	1	2	3	4
Noise sensitivity, easily upset by loud noise	0	1	2	3	4
Sleep disturbance	0	1	2	3	4
Fatigue, tiring more easily	0	1	2	3	4
Being irritable, easily angered	0	1	2	3	4
Feeling depressed or tearful	0	1	2	3	4
Feeling frustrated or impatient	0	1	2	3	4
Forgetfulness, poor memory	0	1	2	3	4
Poor concentration	0	1	2	3	4
Taking longer to think	0	1	2	3	4
Blurred vision	0	1	2	3	4
Light sensitivity, easily upset by bright light	0	1	2	3	4
Double vision	0	1	2	3	4
Restlessness	0	1	2	3	4
Are you experiencing any other difficulties?					
1	0	1	2	3	4
2.	0	1	2	3	4
		-			-



Rehabilitation Professional's Checklist

Critical Symptom List					
Post Trauma Vision Syndrome					
Double vision					
Headaches					
Blurry vision					
Dizziness or nausea					
Attention or concentration difficulties					
Staring behaviour (low blink rate)					
Spatial disorientation					
Loses place when reading					
Cannot find beginning of next line when reading					
Comprehension problems					
Visual memory problems					
Moves backwards from objects too close					
TOTAL	/12				

Rehabilitation Professional's Checklist

Visual Midline Shift Syndrome	
Dizziness or nausea	
Spatial disorientation	
Consistently walked to one side of hallway or room	
Bumps into objects when walking	
Poor balance or posture; leans back on heels, forward or to one side when walking, standing or seated in a chair	
TOTAL	/5
COMBINED TOTAL	/17
Note: According to the Neuro-Optometric Rehabilitation Association (NORA) if one or more symptoms are checked, referral for neuro-optometric evaluation would be appropriate.	



Rehabilitation Professional's Checklist

Post Trauma Vision Syndrome (PTVS) Checklist:

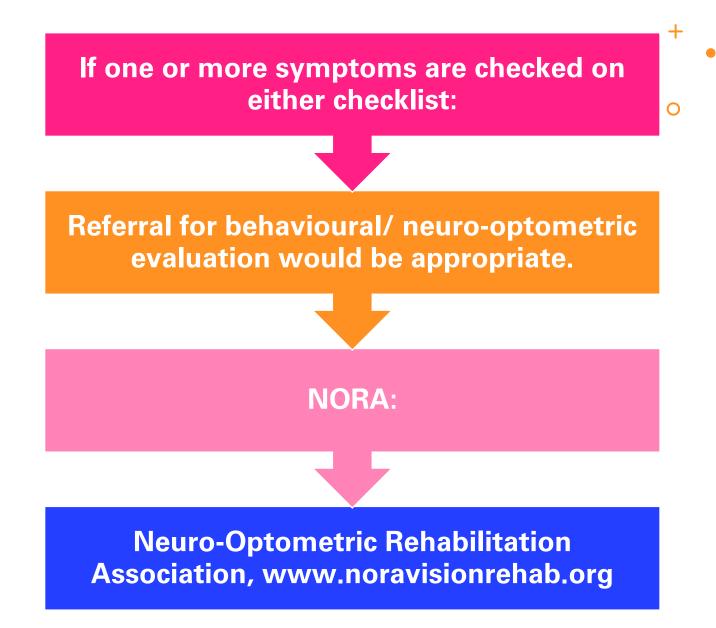
- Double vision
- Headaches
- Blurry vision
- Dizziness or nausea
- Attention or concentration difficulties
- Staring behaviour (low blink rate)
- Spatial disorientation
- Loses place when reading
- Cannot find beginning of next line when reading
- Comprehension problems
- Visual memory problems
- Moves backward from objects too close

Rehabilitation Professional's Checklist

Visual Midline Shift Syndrome (VMSS) Checklist:

- Dizziness or nausea
- Spatial disorientation
- Consistently walked to one side of hallway or room
- Bumps into objects when walking
- Poor balance of posture: leans back on heels, forward or to one side when walking, standing or seated in a chair.

Rehabilitation Professional's Checklist



NORA: Neurooptometric Rehabilitation Association

- www.noravisionrehab.org
- Tips for Managing vision problems associated with Brain Injury (good video)

 Information site for patients and providersto print

STANDING POSTURE

Cognitive

Vestibular

Visual

Neurologic

Musculoskeletal

Proprioception

Kinaesthesia



Rehabilitation Plan

1. explanation and education (pain, TBI, trauma)

2.pain/symptom managementmusculoskeletal, visual, vestibular, balance, proprioception, cognitive

3. development of activity/exercise program- incorporating all dimensions (within your scope of practice)

4. referral to other health practitioners as needed

PAIN/ SYMPTOM MANAGEMENT

Challenging to develop a rehabilitation program (function, activity, exercise) considering all the elements affecting recovery

Musculo-skeletal

Neurological (motor control, central pain)

Visual

Vestibular

Cognitive

Kinaesthetic/Proprioception

Work on one system at a time; and gradually integrate into a unique and individualized program







ORGANIZATIONAL RESOURCES

- International Association for the Study of Pain <u>www.iasp-pain.org</u>
- Canadian Pain Society <u>www.canadianpainsociety.ca</u>
- NORA: Neuro-optometric Rehabilitation Association <u>www.noravisionrehab.com</u>
- VeDA: Vestibular Disorders Association <u>www.vestibular.org</u>
- Ontario Neurotrauma Foundation <u>www.onf.org</u>
- Ontario Brain Injury Association <u>www.obia.org</u>

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