

Strategies for Improving Mental Health after Concussion

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Outline

Mental Health and Concussion

Background

Types of Difficulties

Cycle of Prolonged Symptoms

Managing Mental Health

Non-pharmacological

The Basics

Talk Therapy

Mindfulness

Peer Support

What I hope you take away today

1. Why mental health symptoms happen
2. Why they persist
3. What actually helps

Mental Health and Concussion Background

Epidemiology in Ontario

- ~ 150,000 new concussions in Ontario/year
- ~15-20% experience prolonged symptoms
 - ~22,500-30,000 Ontarians/year endure prolonged symptoms

Journal of Head Trauma Rehabilitation: [January/February 2020 - Volume 35 - Issue 1 - p E60-E66](#)

Symptoms of Concussion



Acute vs Prolonged

Table A. Common Symptoms of mTBI

Physical	Behavioural/Emotional	Cognitive
Headache	Drowsiness	Feeling “slowed down”
Nausea	Fatigue/lethargy	Feeling “in a fog” or “dazed”
Vomiting	Irritability	Difficulty concentrating
Blurred or double vision	Depression	Difficulty remembering
Seeing stars or lights	Anxiety	
Balance problems	Sleeping more than usual	
Dizziness	Difficulty falling asleep	
Sensitivity to light or noise		
Tinnitus		

Adapted from Willer B, Leddy JJ. Management of concussion and post-concussion syndrome. *Current Treatment Options in Neurology*. 2006;8:415-426; with kind permission from Springer Science and Business Media.

Mental Health and Concussion

- Mental health difficulties are common post-concussion and appear to be **major determinants** of post-concussion wellness and functional recovery.
- Approximately **1 in 5 individuals** may experience mental health symptoms up to 6 months after mild traumatic brain injury.

**Monitor, screen and intervene early.
Doing so improves recovery trajectories.**

Stein MB et al. **Posttraumatic stress disorder and major depression after civilian mild traumatic brain injury: A TRACK-TBI study.** JAMA Psychiatry. January 30, 2019.

Bryant et al. . **The psychiatric sequelae of traumatic injury.** Am J Psychiatry 2010;167:312–20. 10

Lange et al. **Depression strongly influences postconcussion symptom reporting following mild traumatic brain injury.** J Head Trauma Rehabil 2011;26:127–37

Zahniser E, Nelson LD, Dikmen SS, et al. . **The temporal relationship of mental health problems and functional limitations following mTBI: a TRACK-TBI and TED study.** J Neurotrauma 2019;36:1786–93

Suicide

Association Between Traumatic Brain Injury and Risk of Suicide

Madsen et al. *JAMA*. 2018;320(6):580-588

- Relative to those without a TBI, those diagnosed with concussion or mild TBI were twice as likely to die by suicide compared to those who had not been diagnosed with a concussion or mild TBI

Demographic-Dependent Risk of Developing Severe Novel Psychiatric Disorders after Concussion

Shahrestani et al., *J Neurotrauma*. 2022 Jan;39(1-2):131-137

- In patients <26 years of age, significantly increased rates of depression, anxiety, or suicidal ideation following concussion in all groups
- adult cohort also demonstrates significant increases in NPDs at readmission within 180 days.

Early detection, treatment of mental health difficulties, and social support substantially reduce risk.

Mental Health and Concussion - Causes?

Physiological Brain Changes

Suggestion of dysregulation of cerebral blood flow (CBF) and mismatch between metabolic needs of brain and CBF delivery

Symptom Overlap

Impact of pain, poor sleep, cognitive problems, fatigue...

Autonomic Nervous System Dysregulation

The nervous system gets stuck on 'high alert' – and that can drive mood, sleep and pain symptoms.

Other Issues

Impact of med-legal, WSIB, insurance, invisible disability, functional decline

For most people, it is not one cause – it's several interacting factors.

Cycle of Prolonged Symptoms

Concussion

Critical Initial Targets:

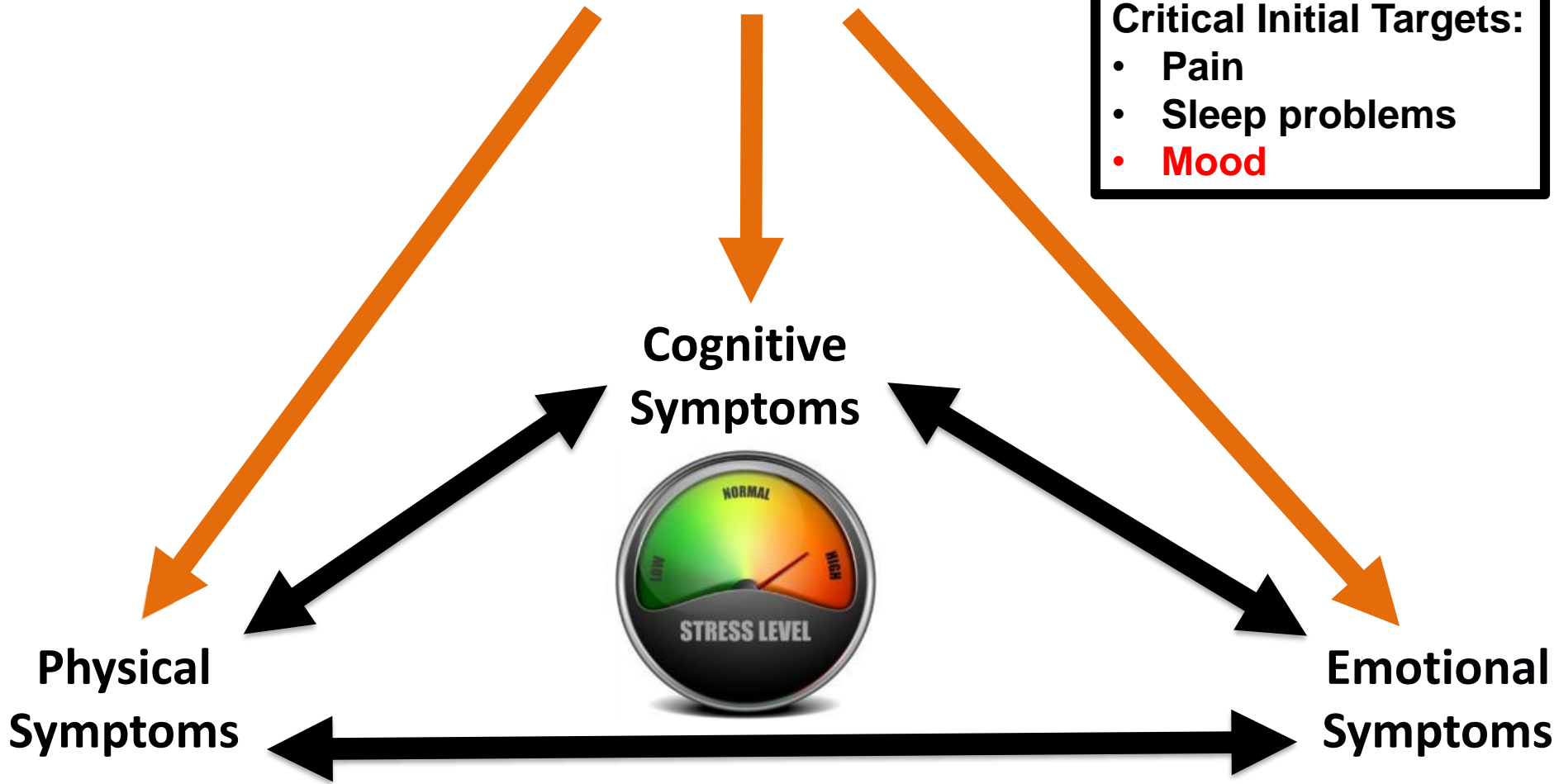
- Pain
- Sleep problems
- **Mood**

Cognitive Symptoms



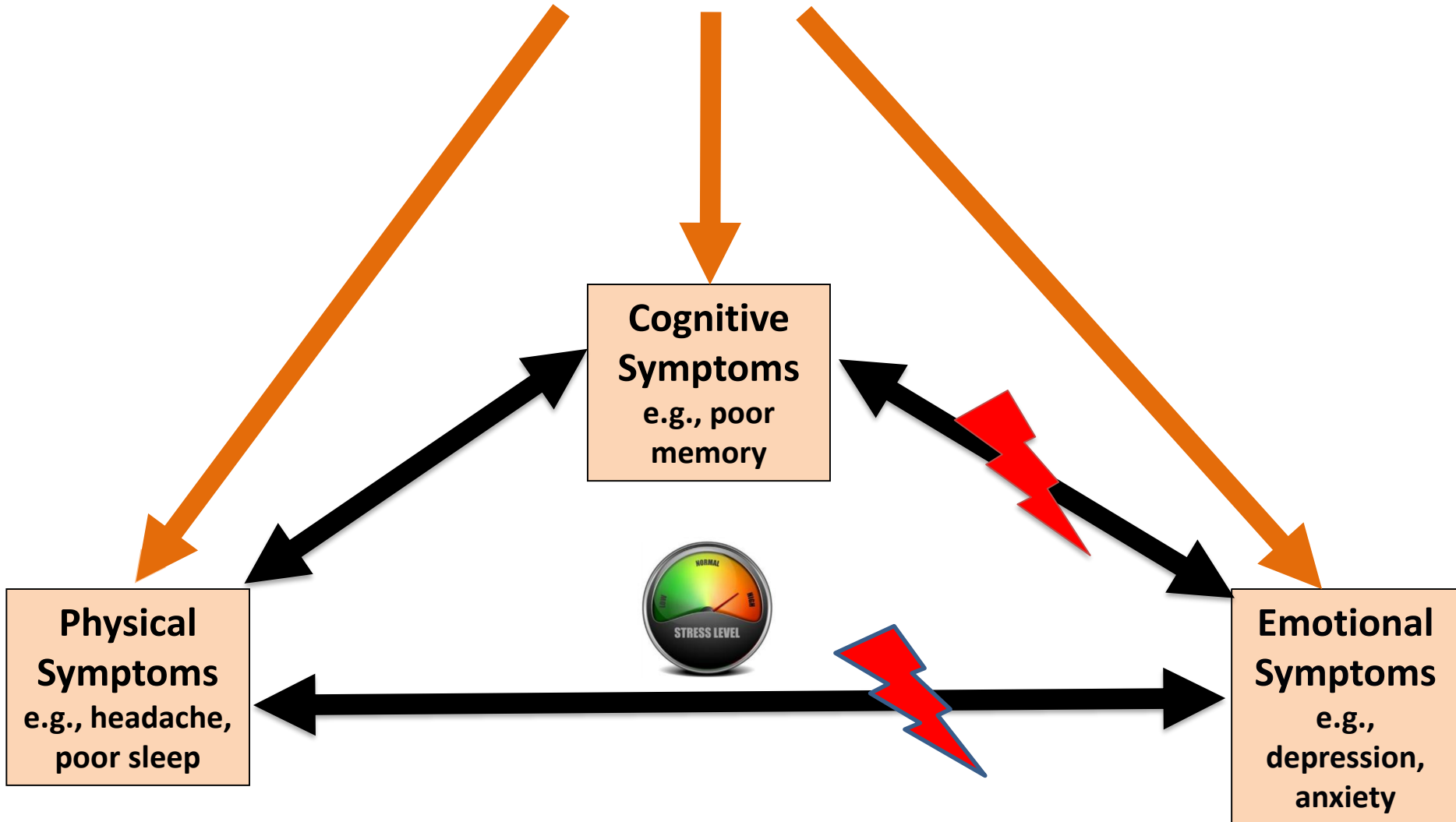
Physical Symptoms

Emotional Symptoms



Intervening in the Cycle

Concussion



Managing Mental Health

Living Guidelines – Ontario, Canada

Mental Health Treatment

Treat when symptoms cause distress, impact function and quality of life or are slowing recovery.



The screenshot shows a digital document interface. At the top left, there are four small images: a brain scan, a brain, a brain with neural connections, and a brain with a crack. To the right of these images is the title: "GUIDELINE FOR CONCUSSION/MILD TRAUMATIC BRAIN INJURY & PROLONGED SYMPTOMS" followed by "3RD EDITION, FOR ADULTS OVER 18 YEARS OF AGE". Below the title is the section "Mental Health Disorders" with a "< BACK" link and a "> Open all content" link. The document is organized into sections with expandable/collapsible bars: "Introduction", "Assessment of Mental Health Disorders", "Non-Pharmacological Treatment of Mental Health Disorders", and "Pharmacological Treatment of Mental Health Disorders". Each section has a "Recommendations" bar below it. An orange arrow points from the "Recommendations" bar under "Non-Pharmacological Treatment of Mental Health Disorders" to a text box on the right.

Primary care providers,
psychologists, other mental
health specialists

Living Guidelines – Mental Health Treatment

Psychological interventions (‘non-pharmacological’)

- critical in managing primary mental health disorders
- ‘talk therapy’ (e.g., cognitive behavioural therapy/CBT)
- scientific support for CBT across multiple mental health conditions including concussion

Not everyone needs specialist mental health treatment-but everyone benefits from monitoring and early support.

Review Curr Neurol Neurosci Rep. 2023 Mar;23(3):49-58. **Management of Psychological Complications Following Mild Traumatic Brain Injury.** [Silverberg](#) & [Mikolić](#)

*Broad-spectrum cognitive-behavioral therapy may modestly improve post-concussion symptoms, but **tailoring delivery to individual psychological risk factors** and/or symptoms may improve its efficacy.*

Managing Mental Health

- The Basics: Self-Care
- Cognitive Behaviour Therapy
- Mindfulness Meditation
- Peer Support

Front Neurol 2022. **Mental Health Outcomes Across the Lifespan in Individuals With Persistent Post-Concussion Symptoms: A Scoping Review.** Sheldrake et al.

- Biopsychosocial and holistic approach that addresses both physical and mental health needs should be emphasized

Start with the Basics



These are not 'soft' interventions; they are biologically active recovery tools.

Sleep

Research indicates:

- chronic poor sleep and insomnia can contribute to the development of depression, anxiety, irritability and vice versa
- glymphatic system works while we sleep to clear waste from the brain
- screening and treating insomnia reduces symptoms of depression, anxiety, and stress

Sleep is one of the highest yield intervention points - improving sleep often improves mood, pain and cognition.

[CCC LiUNA Webinar Series #42: Dr. Neal Parekh](#)

Nutrition

Good nutrition **supports** recovery; it is not a stand alone treatment

► Nutrients. 2023 Aug 25;15(17):3726. doi: [10.3390/nu15173726](https://doi.org/10.3390/nu15173726)

A Potential Role Exists for Nutritional Interventions in the Chronic Phase of Mild Traumatic Brain Injury, Concussion and Sports-Related Concussion: A Systematic Review

[Tansy Ryan](#)¹, [Sarah Nagle](#)¹, [Ed Daly](#)¹, [Alan J Pearce](#)², [Lisa Ryan](#)^{1,*}


 **Neurochirurgie** 
Volume 67, Issue 3, May 2021, Pages 255-258

General review

Nutritional factors in sport-related concussion

S. Walrand^a, , R. Gaulmin^b, R. Aubin^b, V. Sapin^c, A. Coste^d, M. Abbot^{b,e}

Which Foods Help the Brain?




BRAIN HEALTH FOOD GUIDE 

An Evidence-Based Approach to Healthy Eating for the Aging Brain

<https://www.baycrest.org/getattachment/0c3275c8-2419-4f12-ad71-a890d5f70265/Brain-Health-Food-Guide.aspx>

Physical Exercise

-  BDNF (brain derived neurotropic factor) - supports survival/growth of new neurons and synapses
- Positive effect on mood, stress and cognition
- Low-level exercise for those slow to recover may be of benefit
- 'More is not better'

[Postconcussion Moderate to Vigorous Physical Activity Predicts Anxiety Severity among Adolescent Athletes](#)

SMULLIGAN, KATHERINE L.; WINGERSON, MATHEW J.; MAGLIATO, SAMANTHA N.; RADEMACHER, JACOB G.; WILSON, JULIE C.; HOWELL, DAVID R..

Medicine & Science in Sports & Exercise 2024; 56(5): 790-795.

[Dr. Mark Bayley - Exercise
Therapy for Concussion](#)

Pacing

MyBrainPacer™

[MyBrainPacer™](#) was co-designed by ABI patients and their caregivers, integrating technology and health care expertise into one easy-to-use tool. The app helps users safely monitor and track their daily activity and concussion symptoms using a smartphone, tablet, or personal computer.

An example of how pacing can be operationalized.

St. Joseph's Healthcare & Parkwood Institute, London, Ontario

<https://www.sjhc.london.on.ca/news-and-media/our-stories/pacing-your-recovery>

Self Care - Other

- ❖ If mental health symptoms persist after implementing basic self-care strategies, discuss other potential treatable causes of mood change such as **thyroid dysfunction, vitamin B12 deficiency, low iron, hormonal changes** etc. with your family physician/primary care provider.

Managing Mental Health

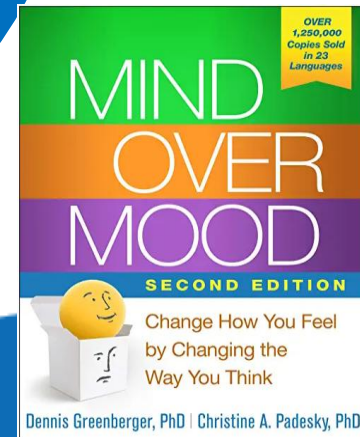
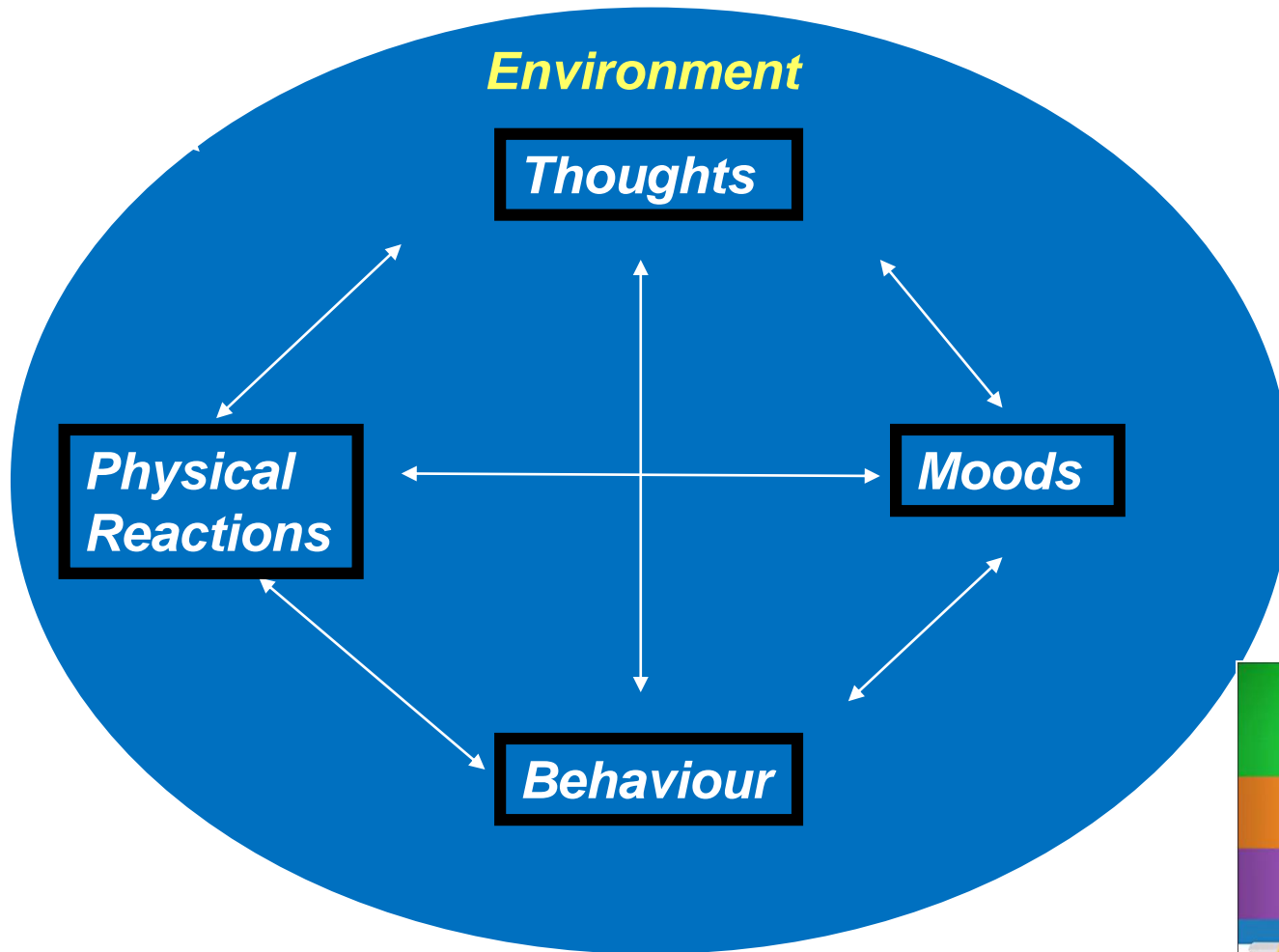
- The Basics: Self-Care
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- Mindfulness Meditation
- Peer Support

Background – Cognitive Behavioural Therapy (CBT)

- goal-oriented, short-term psychotherapy
- teaches strategies and skills
- focuses on ‘here-and-now’ problems
- collaborative effort between therapist and client



The Five Factor Model of CBT



Background - CBT

Psychological problems believed to be based, in part, on:

- unhelpful ways of thinking (that ‘inner voice’)
- learned patterns of unhelpful behaviour

Each headache becomes a signal of danger – avoidance increases – symptoms persist.



How does CBT evoke change?

CBT encourages us to:

- question our thoughts
- identify cognitive distortions
- identify more balanced alternatives
- challenge assumptions leading to automatic thoughts
- test out alternatives in the real world (i.e., behavioural experiments)

CBT is not about telling yourself 'it's all in your head' - it helps the brain recover by changing patterns that keep symptoms going.

Managing Mental Health

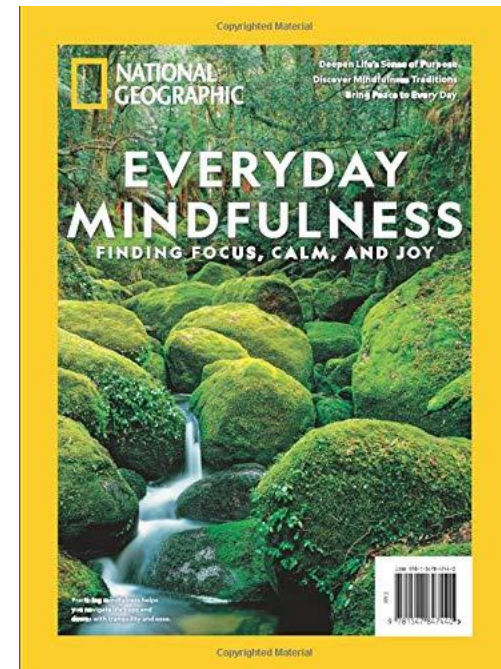
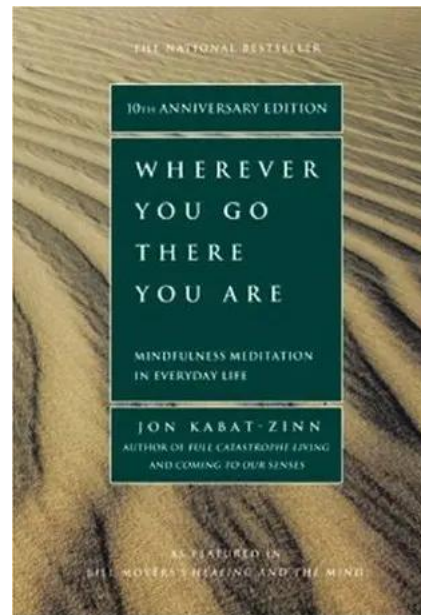
- The Basics: Self-Care
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Mindfulness

The awareness that emerges from paying attention to something in a particular way:

- On purpose
- In the present moment
- Nonjudgmentally

Kabat-Zinn, J.



Mindfulness

“Most people assume that meditation is all about stopping thoughts, getting rid of emotions, somehow controlling the mind. But actually...it’s about stepping back, seeing the thought clearly, witnessing it coming and going.”

Andy Puddicombe (Headspace)

Mindfulness = training attention + changing our relationship to symptoms

Mindfulness

Possible benefit for:

- stress, anxiety, depression, pain, fatigue, sleep, attention...

Clinical Utility of Mindfulness Training in the Treatment of Fatigue After Stroke, Traumatic Brain Injury and Multiple Sclerosis: A Systematic Literature Review and Meta-analysis

by [Ulrichsen, Kristine M](#); [Kaufmann, Tobias](#); [Dorum, Erlend S](#); [More...](#)

Frontiers in psychology, 2016, Volume 7

Mindfulness-based cognitive therapy reduces symptoms of depression in people with a traumatic **brain injury**: results...

by [Bédard, Michel](#); [Felteau, Melissa](#); [Marshall, Shawn](#); [More...](#)

The journal of head trauma rehabilitation, 07/2014, Volume 29, Issue 4

Therapeutic Effects of Meditation, Yoga, and **Mindfulness**-Based Interventions for Chronic Symptoms of Mild Traumatic **Brain Injury**...

by [Acabchuk, Rebecca L](#); [Brisson, Julie M](#); [Park, Crystal L](#); [More...](#)

Applied psychology : health and well-being, 02/2021, Volume 13, Issue 1

Disabil Rehabil. 2023 **Feasibility of group telerehabilitation for individuals with chronic acquired brain injury: integrating clinical care and research.** [Boulos](#) et al.

A qualitative study exploring the experiences of **mindfulness** training in people with acquired **brain injury**

by [Niraj, Shruti](#); [Wright, Sue](#); [Powell, Theresa](#)

Neuropsychological rehabilitation, 04/2020, Volume 30, Issue 4

Mindfulness

Studies suggest that mindfulness can have positive effects on the brain...

Mindfulness is a skill, not a personality trait – and even short practices can help.

8-week **Mindfulness** Based Stress Reduction induces brain changes similar to traditional long-term meditation...

by [Gotink, Rinske A](#); [Meijboom, Rozanna](#); [Vernooij, Meike W](#); [More...](#)

[Brain and cognition](#), 10/2016, Volume 108

Mindfulness related changes in grey matter: a systematic review and meta-analysis

by [Pernet, Cyril R](#); [Belov, Nikolaj](#); [Delorme, Arnaud](#); [More...](#)

[Brain imaging and behavior](#), 02/2021

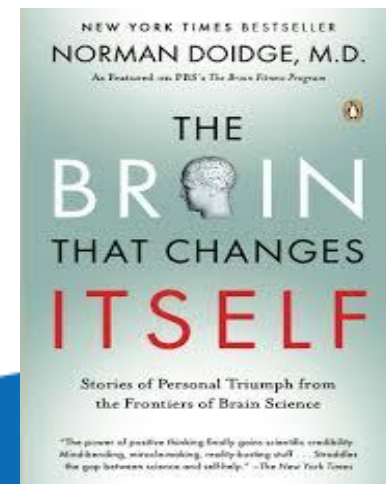
Neural changes in early visual processing after 6 months of mindfulness training in older adults. Isbel et al, Scientific Reports. **Volume 10**, (2020)

Neuroplasticity

The brain:

- can change its structure & function through thought and activity
- architecture differs between people and changes in the course of our lives

Neuronal response to thoughts...habits and patterns are established and reinforced (good and bad!)



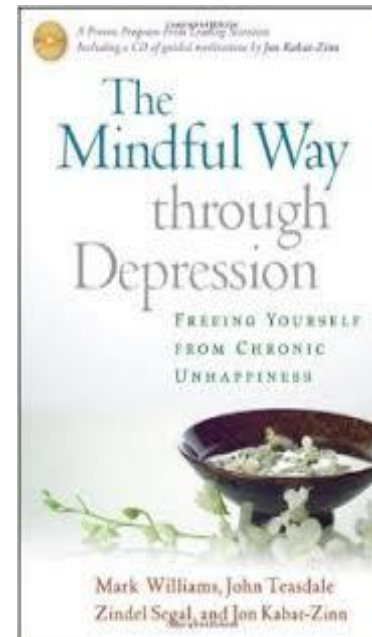
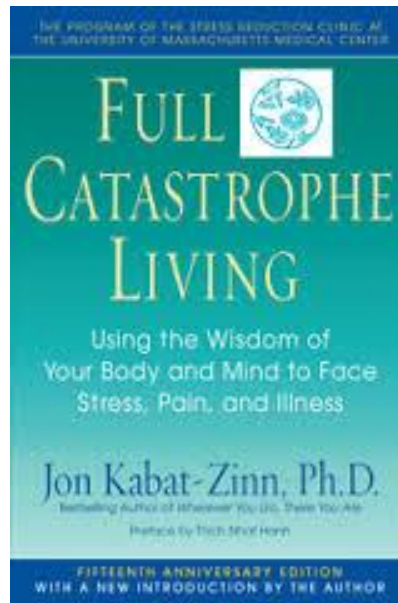
'Therapeutic' Mindfulness

Mindfulness Based Stress Reduction (MBSR)

(Jon Kabat-Zinn, 1979, U Mass)

Mindfulness Based Cognitive Therapy (MBCT)

(Zindel Segal, Mark Williams & John Teasdale, Toronto/UK)



Mindfulness

A Story of Traumatic Brain Injury

[Story of Kevin Pearce, professional snowboarder](#)

<https://www.loveyourbrain.com/>

Documentary – *The Crash Reel*

Peer Support

Good support groups should offer a safe place:

- to ask questions and tell your story
- learn/share coping strategies
- share what has worked/not worked
- place to meet others who want to build healthier habits to optimize recovery

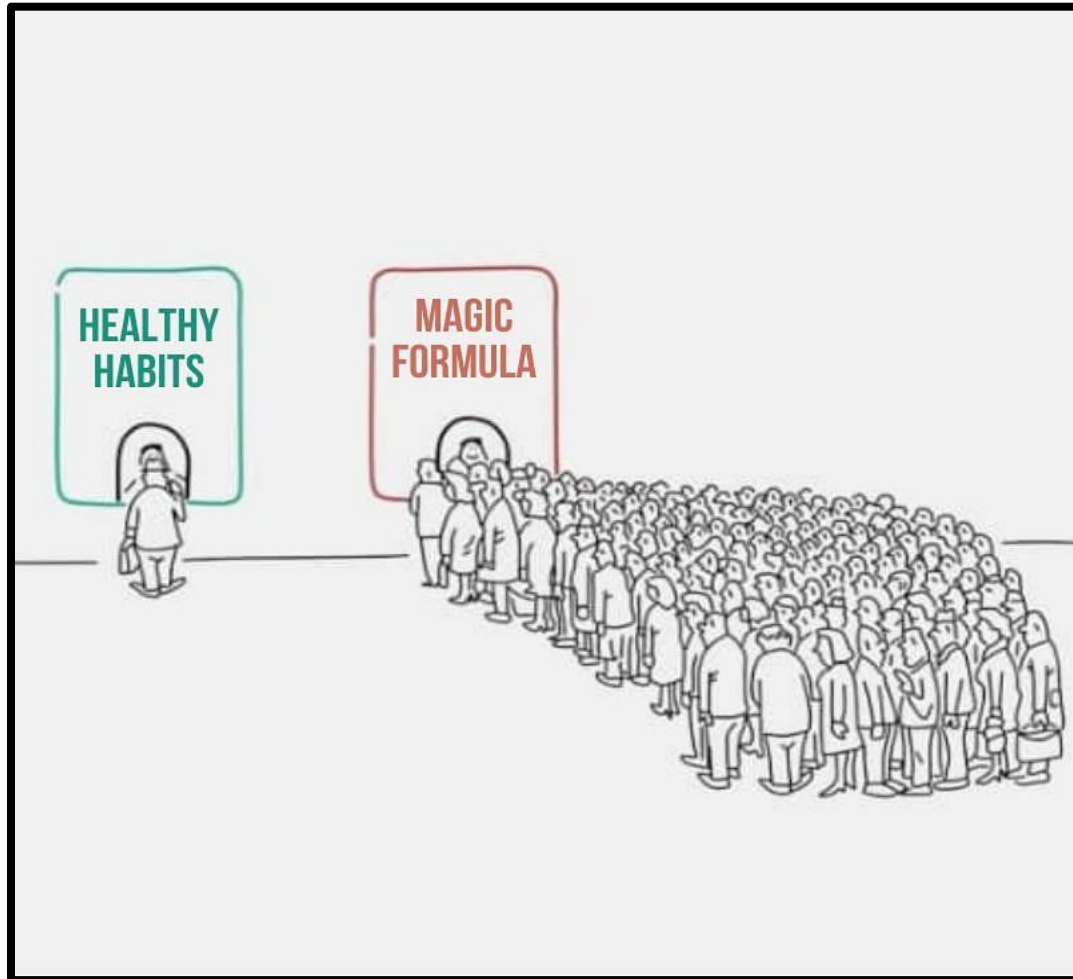
Avoid groups that are negative, stuck on what is wrong and lacking in direction forward.

**If a group makes you feel worse after attending, that is useful information.
Not every group fits every person – it's okay to keep looking.**

Peer support interventions for individuals with acquired brain injury, cerebral palsy, and spina bifida: a systematic review. [Levy et al.](#) *BMC Health Services Research* Vol 19, 2019

College and Concussion Recovery: Students Reflections of the Role of Peer Support. [Kemp et al.](#) *Archives of Physical Medicine and Rehabilitation*, 2020, Vol 101, Issue 11, Pages e23-e23

Take Home Messages



Credit: Hal Elrod

Take Home Messages

- Multi-pronged approach
- Address each symptom - regardless of the cause
- Beware of vicious cycle(s)
- Effective treatments and strategies are available
- Determine what works for you – start small

Recovery after concussion is rarely linear – but improvement over time is the norm.

Resources - Crisis Lines & General Supports

9-8-8 Suicide Crisis HelpLine (CALL or TEXT 24/7)

Ontario - <https://ontario.cmha.ca/provincial-mental-health-supports/>

- **Distress and Crisis Ontario:** <http://www.dcontario.org/>
Distress Centres (DC's) across Ontario offer support and a variety of services to their communities. 24/7. The website also offers a chat function.
- **Good2Talk Helpline:** 1-866-925-5454 or text GOOD2TALKON to 686868
Ontario's 24/7 helpline for postsecondary students.
- **Assaulted Women's Helpline:** TOLL-FREE: 1-866-863-0511
TOLL FREE TTY: 1-866-863-7868
#SAFE (#7233) on your Bell, Rogers, Fido or Telus Mobile

Resources – Crisis Lines & General Supports

- **ConnexOntario:** 1-866 -531-2600 or www.connexontario.ca
Free and confidential health services information for people experiencing problems with alcohol and drugs, mental health and/or gambling. Available 24/7.
- **Hope for Wellness Help Line:** 1-855-242-3310
Offers immediate mental health counselling and crisis intervention to all Indigenous peoples across Canada. Phone and chat counselling is available in English, French, Cree, Ojibway and Inuktitut.
- **National Indian Residential School Crisis Line:** 1-866-925-4419
Offers support to former residential school students and those affected. Available 24 hours.
- **Talk4healing** (for Indigenous women): 1-855-554-4325

Resources – Brain Injury/Concussion

Parachute Canada

<https://parachute.ca/en/injury-topic/concussion/>

Canadian Concussion Collaborative

<https://casem-acmse.org/resources/canadian-concussion-collaborative/>

Brain Injury Canada

<https://braininjurycanada.ca/en/survivor/concussion/resources-community/resources>

Ontario Brain Injury Association (OBIA). Helpline: 1-800-263-5404

www.obia.ca

Concussions Ontario

<https://concussionsontario.org/>

Resources – Brain Injury/Concussion

Living Concussion Guidelines – Patient Version

http://braininjuryguidelines.org/concussion/fileadmin/Patient_Version_-_Updates_PDFs2019/8.Mental_health_disorders.pdf

Brain Injury Society of Toronto (BIST)

www.bist.ca

Toronto ABI Network

<https://abinetwork.ca/individuals-families/concussions/concussion-resources/>

Canadian Concussion Centre

https://www.uhn.ca/Krembil/Research/Projects/Canadian_Concussion_Centre

Concussion Alliance

<https://www.concussionalliance.org/> (United States)

Resources - Mindfulness

Apps:

- Insight Timer
- Smiling Mind
- UCLA Mindful
- Healthy Minds Program
- Calm

<https://mindfulnessexercises.com/free-online-mindfulness-courses/>

<https://academy.happiness.com/courses/online-mindful-based-stress-reduction>

TED Talk

https://www.ted.com/talks/matt_killingsworth_want_to_be_happier_stay_in_the_moment

Resources - CBT

Apps

- MindShift
- CBT-i Coach

BounceBack: <https://bouncebackontario.ca/>

AbilitiCBT: <https://myicbt.com/home>

Mind Beacon: <https://www.mindbeacon.com/>

Ontario Psychological Association – Find a Psychologist:
<https://www.psych.on.ca/Public/Find-a-Psychologist>

Resources – Group Offering

**KITE Tele-Rehab Centre for Acquired Brain Injury
Toronto Rehab, UHN (Free Group Support)**

<https://kiteteleneurorehab.ca/>

- Cognitive Behaviour Therapy Skills (CBT)
- Goal Management Therapy (GMT)
- Mindfulness Skills Training (MST)
- Concussion Education and Symptom Management (CESM)

Questions???