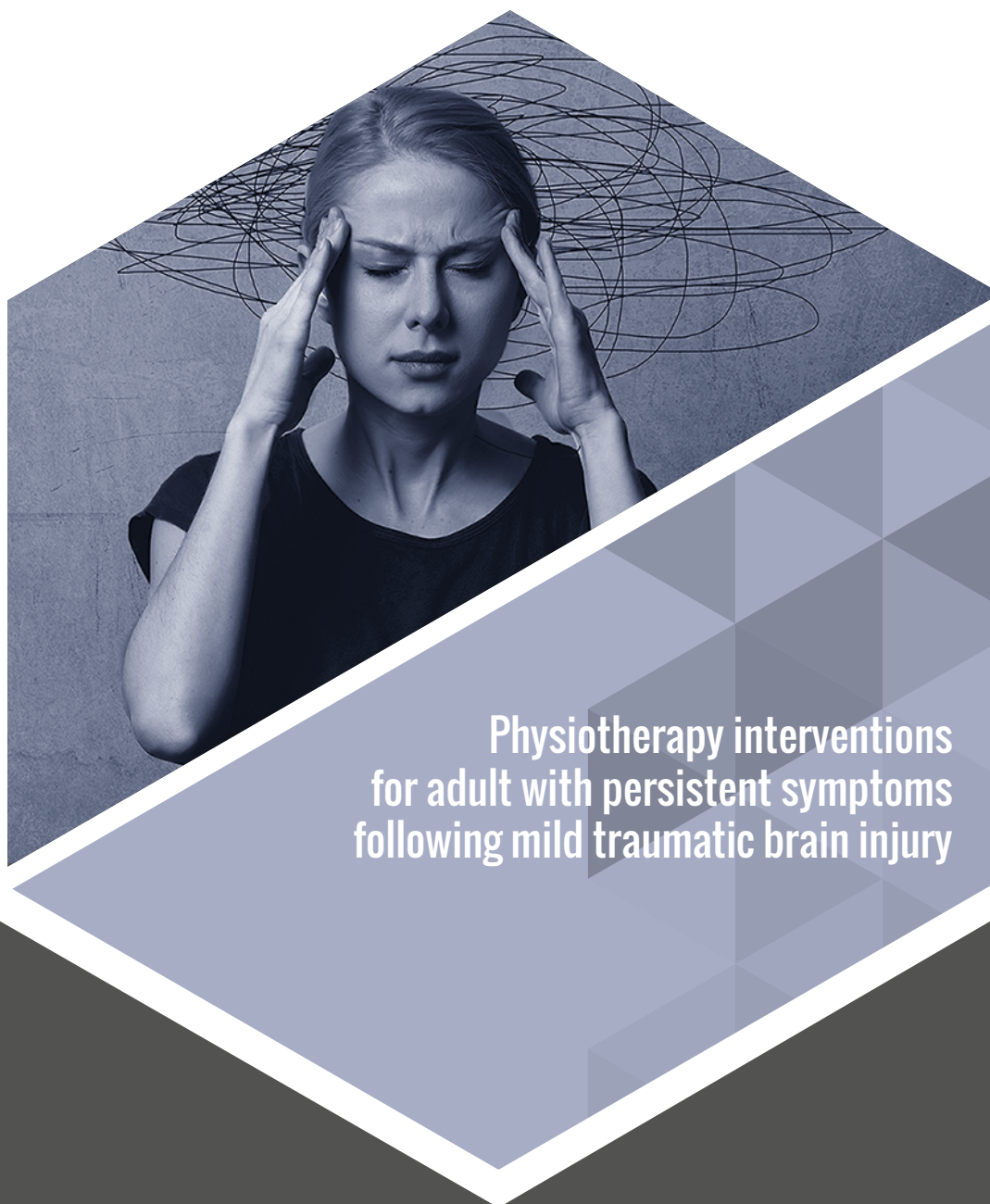




Physiotherapy interventions
for adult with persistent symptoms
following mild traumatic brain injury

EXECUTIVE SUMMARY

of the abridged ETMI report

AUTHORS

Jacky Ndjepel, Professional coordinator, Assessment of technologies and methods of intervention in health and social services Unit (Unité d'évaluation des technologies et des modes d'intervention en santé et services sociaux – UETMISSS), Direction de l'enseignement et des affaires universitaires (DEAU), Centre intégré universitaire de santé et de services sociaux (CIUSSS) de la Capitale-Nationale

Sylvie St-Jacques, Scientific Responsible, UETMISSS, DEAU, CIUSSS de la Capitale-Nationale

APPLICANTS

Debbie Furlotte, Head of Traumatic Brain Injury Program, Direction Déficience intellectuelle, trouble du spectre de l'autisme et déficience physique, CIUSSS de la Capitale-Nationale

MANDATE MANAGERS

Isabelle Beaumier, Head of ETMISSS and the Library, DEAU, CIUSSS de la Capitale-Nationale

GRAPHIC DESIGN

Karine Binette, graphic arts technician, Service du transfert des connaissances et du rayonnement, DEAU, CIUSSS de la Capitale-Nationale

TRANSLATION

Traduction Tandem

LIABILITY

The information in this document does not engage the liability of the CIUSSS de la Capitale-Nationale, its personnel or professionals in any way. Consequently, the CIUSSS de la Capitale-Nationale and UETMISSS members may not be held liable for any damage whatsoever resulting from the use or interpretation of this information.

HOW TO CITE THIS DOCUMENT

Ndjepel, J. & St-Jacques, J. (2025). *Physiotherapy interventions for adult with persistent symptoms following mild traumatic brain injury* – Executive summary of the abridged ETMISSS report, UETMISSS, CIUSSS de la Capitale-Nationale, 8 p.

January 2025

PRODUCTION

© Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale, 2025

Legal deposit 2025

Bibliothèque et Archives nationales du Québec

ISBN : 978-2-555-00241-8 (PDF)

ISSUE

Mild traumatic brain injury is an invisible injury caused by a rapid back-and-forth movement of the head that causes the brain to strike the walls of the cranium. This injury may result from a traumatic incident caused by a direct impact to the head or any other part of the body that transmits impulsive force to the head. According to the literature, between 34% and 44% of patients with mild traumatic brain injury have persistent symptoms three to six months after the injury. These symptoms can last up to 12 months in 5% to 20% of patients. Dizziness is one of the most frequently reported symptoms following mild traumatic brain injury, and can be disabling several months after the traumatic event. Guidelines and recommendations for the management of mild traumatic brain injury are available in the literature. However, the literature remains limited with regard to interventions aimed at the management of persistent dizziness beyond three months after mild traumatic brain injury.

CONTEXT

As part of the implementation of the regional service organization program for victims of mild traumatic brain injury, a service offering targeting CIUSSS de la Capitale-Nationale emergency room staff was initiated in December 2017. The aim of this program was to contribute to the reduction of incapacity and disability by identifying and implementing effective interventions for patients at risk of persistent functional complications. In order to improve the physiotherapy care offered as part of specialized rehabilitation services, the Direction DI-TSA-DP of CIUSSS de la Capitale-Nationale, specifically the Traumatic Brain Injury Program, asked the Unité d'évaluation des technologies et modes d'intervention en santé et services sociaux (UETMISSS) to support them in making decisions regarding the identification of effective physiotherapy interventions to be implemented for the treatment of patients with persistent symptoms following mild traumatic brain injury, more specifically those presenting with dizziness without vestibular cause.

OBJECTIVE

The aim of this project was to identify physiotherapy interventions (practices, approaches) for the treatment of adults with symptoms persisting beyond three months following mild traumatic brain injury, especially dizziness without vestibular cause. To achieve this objective, the following evaluation questions were formulated:

- What physiotherapy interventions treat persistent symptoms after mild traumatic brain injury?
- Are efficient physiotherapy interventions for the treatment of persistent symptoms after mild traumatic brain injury safe?

For further information, see the report at:

<https://www.ciusss-capitalenationale.gouv.qc.ca/sites/d8/files/docs/MissionUniversitaire/ETMISSS/Rapport-ETMI-abr%C3%A9g%C3%A9-Interventions-physiotherapie-adultes-symptomes-persistants-traumatisme-craniocerebral-leger.pdf>

METHODOLOGY

A systematic review of the literature was carried out. A search strategy was defined in collaboration with a librarian to query the bibliographic databases *Medline (Ovid)*, *Embase (Ovid)* and *CINHAL (EBSCO)*. A search of the grey literature was also carried out. The relevant studies published from January 2000 to April 2024 were selected from the PICOTS typology (Samson & Schoelles, 2012). Two professionals split up the tasks after making sure they had a common understanding of the selection and quality assessment criteria. Data extracted using a structured grid were synthesized and analyzed based on the assessment questions.

RESULTS

The literature search identified 8 279 documents, including 4 354 from the bibliographic databases and 3 925 documents from the grey literature. At the end of the selection process, 15 documents were selected, including 12 primary studies and three documents from the grey literature. The 15 selected documents were published between 2009 and 2023. Most of this documentation comes from Canada (6) and the United States (5). Of the 12 studies included, two were systematic reviews of practice guidelines, eight were quantitative primary studies and the last two used a mixed design. Regarding methodological quality, five studies were of high quality, and five others were of good quality. Two of the three grey literature documents have high credibility, and the other one has moderate credibility.

a) Efficient interventions for the treatment of symptoms persisting beyond three months

- › Group vestibular rehabilitation (Kleffeldgaard et al., 2016; 2019) or combined with other therapy (Adams & Moore, 2017) reduced disability due to dizziness. This is an indirect measure that suggests an impact on dizziness.
- › Vestibular rehabilitation is also recommended in the two systematic reviews (Marshall et al., 2012; 2015) as well as the three grey literature documents retrieved (Department of Veterans Affairs, 2009; Ontario Neurotraumatology Foundation, 2018; Physiotherapy Alberta College Association-PACA, 2019).
- › The effectiveness of aerobic exercise on persistent symptoms, including dizziness, has been reported in one study (Christensen et al., 2020) and in the PACA guidelines (2019).

b) Intervention safety

The safety of the interventions identified was not measured in the studies selected. Nevertheless, group vestibular rehabilitation is reported to have no adverse effects (Kleffeldgaard et al., 2016, 2019). On the other hand, progressive gait augmentation (Alarie et al., 2022) and interdisciplinary treatment (Hugentobler et al., 2015) appear to be safe.

FINDINGS

- › No document specifically dealing with the treatment of persistent dizziness beyond three months has been retrieved;
- › Dizziness is often studied in the presence of other symptoms or is sometimes included in a set of symptoms;
- › In most studies, the origin of the dizziness is not specified (with or without vestibular cause);
- › Among the interventions identified for the treatment of symptoms persisting beyond three months, vestibular rehabilitation was evaluated in three studies, while the other interventions were the subject of a single study each.
- › Overall, the interventions identified were effective in improving various persistent symptoms beyond three months, although statistical significance was not always assessed;
- › The impact of interventions on dizziness has not been specifically measured, but dizziness-related disability has been measured in three studies of vestibular rehabilitation. The reduction in this indicator suggests an effect of this intervention on dizziness;
- › Five other interventions targeting symptoms persisting for more than three months and including dizziness had an impact on the severity of all symptoms measured;
- › The safety of interventions was not measured in the studies selected.
- › Vestibular rehabilitation has shown no adverse effects; progressive increase in walking and interdisciplinary treatment are also considered safe interventions.

CONCLUSION

The available literature is unable to provide a precise answer to the question of the efficacy and safety of interventions to treat persistent symptoms following mild traumatic brain injury due to a low number of publications. More robust studies, such as randomized controlled trials, are needed to confirm the effectiveness of interventions and to help healthcare professionals intervene in patients with persistent dizziness three months after mild traumatic brain injury.

REFERENCES

- Adams, J., & Moore, B. (2017). Return to Meaningful Activities After a Multi-Modal Rehabilitation Programme among Individuals Who Experience Persistent Dizziness and Debility Longer Than 9 Months after Sustaining a Concussion: A Case Series. *Physiotherapy Canada. Physiotherapie Canada*, 69(3), 249–259. <https://doi.org/10.3138/ptc.2015-81ep>
- Alarie, C., Gagnon, I., de Guise, E., McKerral, M., Kersalé, M., Hoog, B. V. H., & Swaine, B. (2022). A Remotely Delivered Progressive Walking Intervention for Adults With Persistent Symptoms of a Mild Traumatic Brain Injury: Feasibility and Exploration of Its Impact. *Frontiers in rehabilitation sciences*, 3, 898804. <https://doi.org/10.3389/fresc.2022.898804>
- Christensen, T., Kyvsgaard, M., Vindelev, P., Joergensen, S., & larsson, b. w. (2020). An active approach in the treatment of post-concussion syndrome - evidence-based practice in a collective case study. <https://doi.org/10.22541/au.159413746.69457665>
- Department of Veterans Affairs et Department of Defense (2009). Clinical practice guideline for Management of concussion/mild traumatic brain injury (MTBI). Version 1.0. États-Unis, 112p.
- Fondation ontarienne de neurotraumatologie - Ontario Neurotrauma Foundation (2018). Guideline for Concussion Mild Traumatic Brain Injury & Prolonged Symptoms - Healthcare Professional Version, Third Edition. Adults (18+ years of age). Toronto – Canada, 250p
- Hugentobler, J. A., Vegh, M., Janiszewski, B., & Quatman-Yates, C. (2015). Physical therapy intervention strategies for patients with prolonged mild traumatic brain injury symptoms: a case series. *International journal of sports physical therapy*, 10(5), 676–689.
- Kleffelgaard, I., Soberg, H. L., Bruusgaard, K. A., Tamber, A. L., & Langhammer, B. (2016). Vestibular Rehabilitation After Traumatic Brain Injury: Case Series. *Physical therapy*, 96(6), 839–849. <https://doi.org/10.2522/ptj.20150095>
- Kleffelgaard, I., Soberg, H. L., Tamber, A. L., Bruusgaard, K. A., Pripp, A. H., Sandhaug, M., & Langhammer, B. (2019). The effects of vestibular rehabilitation on dizziness and balance problems in patients after traumatic brain injury: a randomized controlled trial. *Clinical rehabilitation*, 33(1), 74–84. <https://doi.org/10.1177/0269215518791274>
- Marshall, S., Bayley, M., McCullagh, S., Velikonja, D., & Berrigan, L. (2012). Clinical practice guidelines for mild traumatic brain injury and persistent symptoms. *Canadian family physician Medecin de famille canadien*, 58(3), 257–e140.
- Marshall, S., Bayley, M., McCullagh, S., Velikonja, D., Berrigan, L., Ouchterlony, D., Weegar, K., & mTBI Expert Consensus Group (2015). Updated clinical practice guidelines for concussion/mild traumatic brain injury and persistent symptoms. *Brain injury*, 29(6), 688–700. <https://doi.org/10.3109/02699052.2015.1004755>
- Physiotherapy Alberta College + Association. (2019). Concussion Management: A Toolkit for Physiotherapists. Edmonton – Canada, 59p.
- Samson, D., & Schoelles, K. M. (2012). Chapter 2: medical tests guidance (2) developing the topic and structuring systematic reviews of medical tests: utility of PICOTS, analytic frameworks, decision trees, and other frameworks. *Journal of general internal medicine*, 27 Suppl 1(Suppl 1), S11–S19. <https://doi.org/10.1007/s11606-012-2007-7>

UETMISSS

Centre intégré universitaire de santé et de services sociaux
de la Capitale-Nationale

**Centre intégré
universitaire de santé
et de services sociaux
de la Capitale-Nationale**

Québec

