

Background

- Concussion is one of the leading causes of work-related disability and delayed return-to-work (RTW)¹.
- While most individuals recover within weeks, approximately 15–30% develop persistent concussion symptoms (PCS) that impair functional recovery and occupational reintegration^{2,3}.
- Early multidisciplinary care, including medical, psychological, and rehabilitative support, has been shown to improve outcomes in individuals with PCS⁴.
- However, access to specialized concussion care is often delayed because of variability in diagnosis, referral pathways, and healthcare access⁵.
- The impact of treatment timing on RTW outcomes remains unclear⁶.

Objectives

This study evaluates whether a longer interval between concussion and initiation of multidisciplinary treatment is associated with poorer RTW outcomes.

Methods

- We conducted a prospective cohort study of adults aged 18–65 years with PCS (≥3 symptoms lasting 1–12 months) who were unable to return to pre-injury work.
- Participants were recruited from multidisciplinary concussion programs, including WSIB-affiliated programs, Altum Health, and the Concussion Clinic at Toronto Western Hospital.
- Data was collected via telephone-based assessments or medical record abstraction, capturing demographics, injury characteristics, symptom burden, psychosocial factors, treatment, and RTW status.
- Standardized measures included the Rivermead, DASS-42, and WHOQOL-BREF.
- Follow-ups occurred at 3, 6, 9, and 12 months, assessing symptoms, treatment progress, and RTW outcomes.

Results

A generalized estimating equation (GEE) model was used to evaluate whether the interval between injury and initiation of multidisciplinary treatment predicted return to the pre-injury job across 3-, 6-, 9-, and 12-month follow-ups. Return to the pre-injury job increased significantly over time (OR = 1.21, 95% CI: 1.11–1.33, $p < 0.001$). A longer interval between injury and treatment initiation was associated with lower odds of returning to the pre-injury job (OR = 0.99, 95% CI: 0.98–1.00, $p = 0.012$). Overall, these findings suggest that delays in initiating multidisciplinary treatment are associated with reduced likelihood of returning to pre-injury work, while RTW improves significantly over time.

Table 1. Demographic and RTW Characteristics by Follow-up Period

Follow-up	N	% Female	Age M (SD)	Original RTW Cumulative %	General RTW Cumulative %
3 months	74	75.68	46.38 (10.72)	14.86	64.20
6 months	48	81.25	48.10 (11.15)	18.52	74.07
9 months	41	82.93	48.59 (10.79)	25.93	77.78
12 months	27	88.89	48.89 (10.91)	32.10	77.78

Table 2. GEE Model Predicting Return to Pre-Injury Job

Predictor	β	Odds Ratio (95% CI)	p-value
Interval between DOI and DOE (days)	-0.01	0.99 (0.98–1.00)	0.012
Time (follow-up)	0.19	1.21 (1.11–1.33)	<0.001

Conclusions

Delayed initiation of multidisciplinary treatment following concussion may negatively impact RTW outcomes. Timely access to coordinated care could improve functional recovery and occupational reintegration.

References

1. Conradsen I, Bang-Hansen VE, Sørensen AN, Rytter HM. Return to work in persons with persistent postconcussion symptoms: a survey study examining the perspectives of employees and managers. *Brain Inj.* 2024;38(11):908-917.
2. Ontario Neurotrauma Foundation. *Living Guideline for Diagnosing and Managing Pediatric Concussion*. Toronto (ON): Ontario Neurotrauma Foundation; 2023.
3. Pemmenter CM, Fernández-de Thomas R, Sherman AL. Postconcussive syndrome. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2023.
4. Yeates KO, Schneider KJ, Silverberg ND, et al. Advances in clinical management of persistent postconcussion symptoms. *JAMA Netw Open.* 2021;4(11):e2132221.
5. Ontario Neurotrauma Foundation. *Guideline for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms*. 3rd ed. Toronto (ON): Ontario Neurotrauma Foundation; 2018.
6. Association of Workers' Compensation Boards of Canada. *Predicting Return to Work in Adults Following Concussion*. Mississauga (ON): AWCBC; 2024.

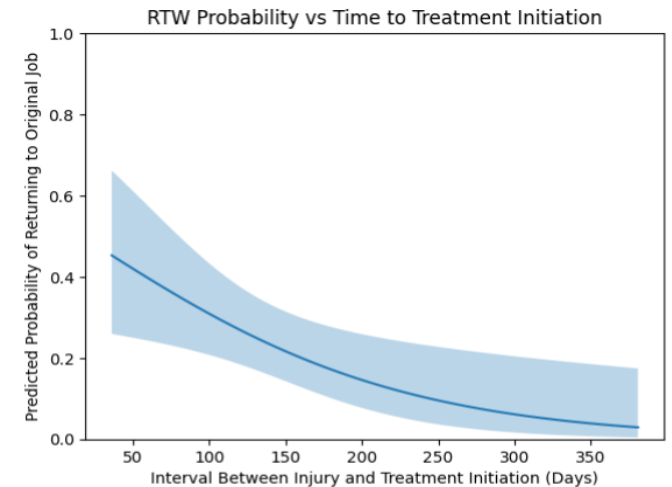


Figure 1. Predicted probability of returning to the pre-injury job decreases as the interval between injury and initiation of multidisciplinary treatment increases.