

Symptom recovery time under the ocular domain for concussion: a systematic review

Brunclik, Cody, ATC, AEMT, DO '26, Des Moines University, College of Osteopathic Medicine
 Jones, Jillian, DPT, CBIS, Des Moines University, Physical Therapy Department



Introduction

- Concussions or mild traumatic brain injuries (mTBI) can be associated with a wide variety of symptoms. These symptoms are classified under concussion domains.^[1]
- Domains group symptoms according to a neurological system and/or neurological function. In conceptualizing symptoms within domains clinicians are able to better identify and understand clinical trajectories following concussion or mTBI.

Purpose

- The purpose of this literature review was to establish recovery times for various symptoms falling under the ocular domain of concussion or mTBI.

Methods

- A table of concussion terms was created for search criteria
- Results were compiled from PubMed, Scopus, Google Scholar, and duplicate results were removed
- If the article reported acceptable outcome measures it was included in the literature review
- An additional hand search for relevant articles was conducted
- A total of 7 relevant articles were found

Conclusion

- From the data collected we can see there is a currently a wide range of recovery timelines being reported for ocular symptoms. Anywhere from 4 days up to 150 days to completely recover from concussion symptoms under the ocular domain. **A majority of the studies that met criteria for this literature review reported oculomotor recovery times of 40 days or less.** This roughly aligns with the study from Cohen et. Al (2022), who looked at all symptoms of concussion and reported that 80% of concussions resolve within 21 days. ^[2]

Studies meeting research criteria

Author (Year)	Type of study	Result (mean or median days to recovery)
Smulligan (2022) ^[3]	Prospective cohort	Mean time to recovery for the dizzy group 40.8 days.
Ellis (2017) ^[4]	Retrospective review	Median recovery time for group with Vestibular-Ocular Dysfunction 40 days.
Whelan (2021) ^[5]	Prospective cohort	Median 11 days
Lawrence (2018) ^[6]	Prospective cohort	Mean 16 days (Fast Recovery Group [recovered by second clinic visit] 9.4 days, Slow Recovery Group [did not recover by second clinic visit] 23.8 days)
Glendon (2021) ^[7]	Prospective cohort	Vestibular-ocular motor screening returns to baseline in mean 14 days, median 8
Master (2018) ^[8]	Retrospective cohort	NPC 125(60-160), Accommodation 150(90-190), Saccades 90(55-175), Smooth pursuit 95(60-175), balance 107(60-170)
Gallagher (2020) ^[9]	Cohort study	Mean symptoms to baseline 13.5 days. Mean days to Return to Play 22.4.

Results

- Median days to recovery was reported between 4 and 150 days.**
- Mean days to recovery was reported at 21.8 days.**
- Additionally, a potentially significant pattern was observed in recovery time when looking at age and the days to therapeutic intervention.**
 - Median recovery time for therapeutic intervention started within 30 days: 4-40 days
 - Median recovery time for therapeutic intervention started after 30 days: 90-150 days
 - Mean recovery time for therapeutic intervention started within 30 days: 21.8 days

Days to recovery based on initiation of treatment

Therapeutic intervention start	Median days to recovery	Mean days to recovery	N=
<30 days	4-40	21.8	753
>30 days	90-150	N/A	234

Application

- A majority of studies showed symptoms under the ocular domain recovered in 40 days or less. While this shows consistency with other studies it should be noted that persistent symptoms need to be specifically addressed when initiating therapeutic intervention
- The finding of an apparent difference in recovery time based on initiation of therapeutic intervention could be useful to clinicians when deciding on an early referral for therapeutic intervention

Future research

- Future research could be focused on establishing timelines to recovery for the other domains of concussion
- Once timelines for recovery can be established across the domains research can then look at current concussion rehab protocols and how they align compared with recovery times in each domain
- Can compare and contrast the strengths and weaknesses of concussion protocols

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