



@physicaltherapyresearch

# RAPID RESEARCH

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December 2022

## Inside This Week: Concussions Effects, Recovery & Classification

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- ✓ Predictors of Recovery from Concussion

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  - ✓ Long-term Effects of Sport-related Concussion

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  - ✓ Sport-related Concussion Subtypes



# PREDICTORS OF RECOVERY FROM CONCUSSION

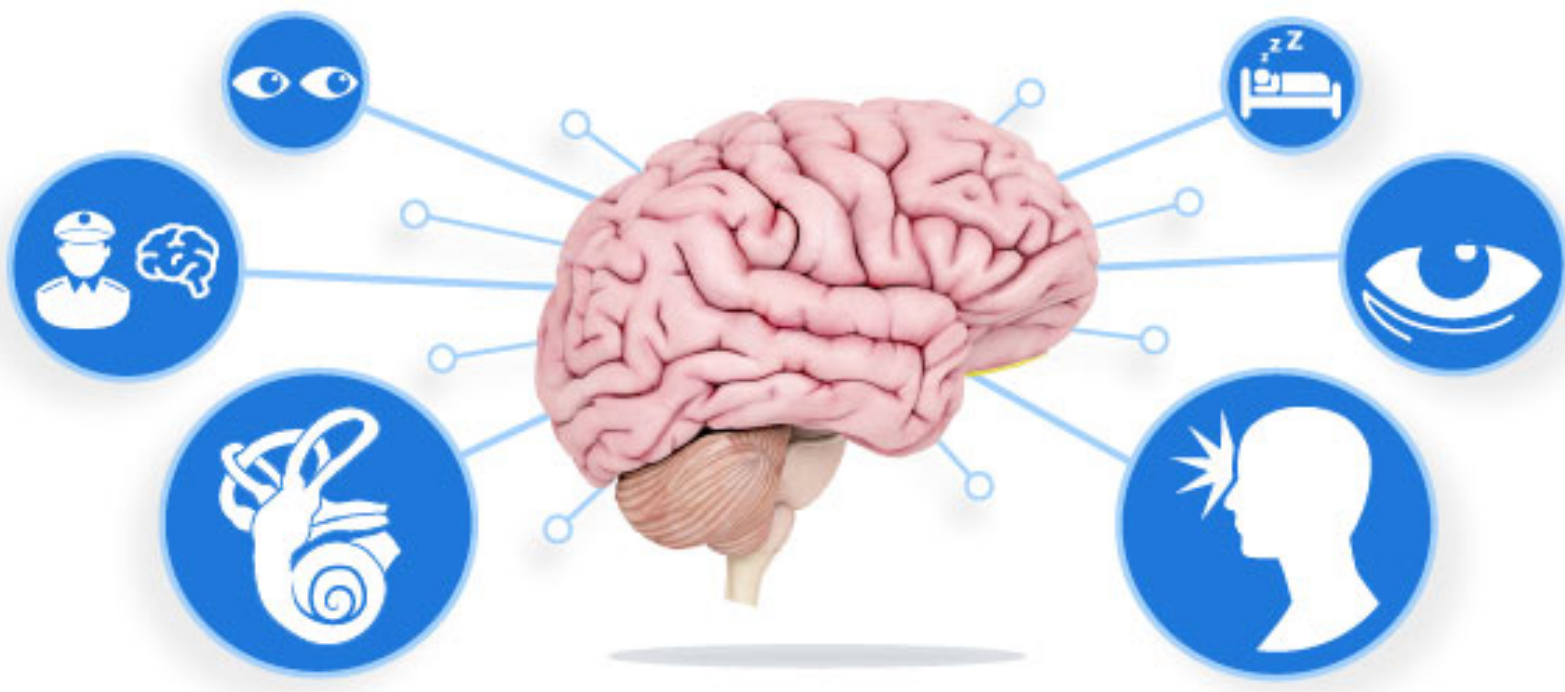
DECEMBER 2022

[Click for Full Text  
\(Iverson et al. 2017\)](#)

JBIR 11/11 [100%]



This systematic review assessed numerous factors that might be considered intermediary, effect modifying, predictor or confounding variables in relation to clinical recovery from concussion.



# KEY FINDINGS

## **101 articles included.**

Major methodological differences across the studies.

Many different clinical outcomes were measured.

## **Most Consistent Predictor of Slower Recovery: Severity of acute and subacute symptoms.**

### Risk Factors for Persistent Symptoms:

Development of headaches or depression lasting greater than a month.

Pre-injury history of mental health problems.

Teenage years (in High-school) Females > Males

Those with attention deficit hyperactivity disorder (ADHD) or learning disabilities **do not appear to be** at substantially greater risk.

# MAIN TAKEAWAYS

The strongest and most consistent predictor of slower recovery from concussion was greater severity of a person's acute and subacute symptoms following injury.

Having a low-level of symptoms in the first day or two following injury was a favorable prognostic indicator.

Children, adolescents and young adults with a pre-injury history of mental health problems or migraine headaches appear to be at somewhat greater risk for having symptoms greater than 1 month.

Screening for risk factors associated with slow recovery may help inform better treatment timelines for those at risk.



# LONG-TERM EFFECTS OF SPORT-RELATED CONCUSSION

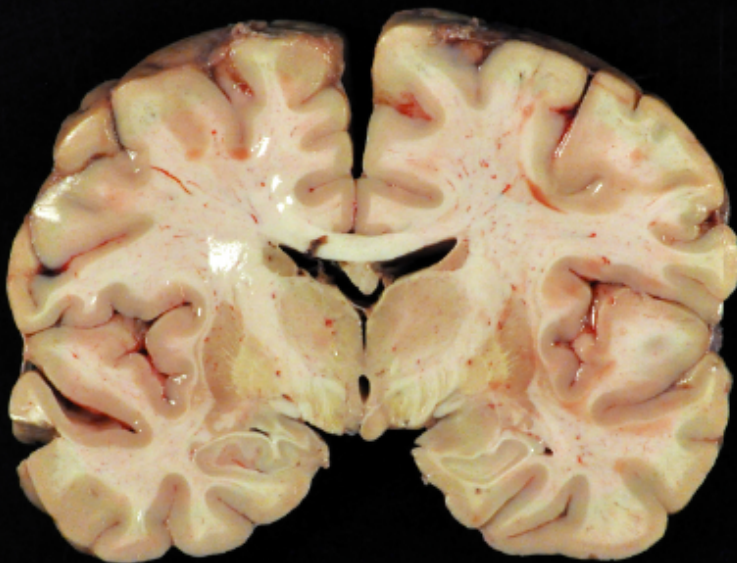
DECEMBER 2022

[Click for Full Text  
\(Manley et al. 2017\)](#)

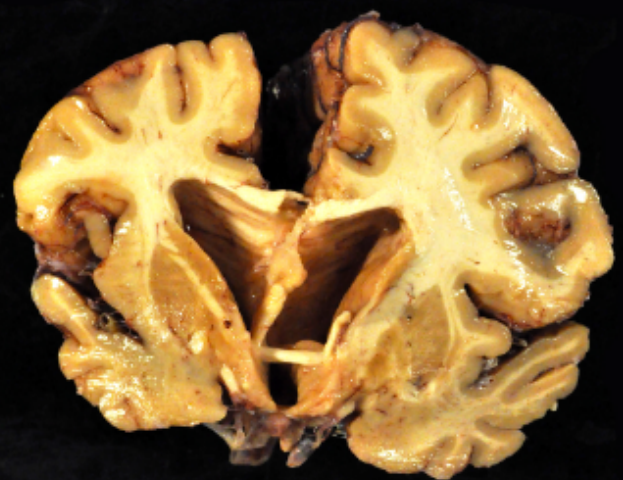
JBI 11/11 [100%]



This systematic review analyzed the possible long-term effects of sport-related concussions, including risk for Alzheimer's disease and CTE.



Normal Brain



Advanced CTE

# KEY FINDINGS

**47 studies included.**

Some former athletes had depression and cognitive deficits later in life, which **is associated with multiple prior concussions.**

Former athletes were **not found to be at an increased risk** for death by suicide.

Former high school American football players **do not appear to be at increased risk for later life neurodegenerative diseases.**

Some retired NFL players may be at **increased risk for** diminishment in cognitive functioning or mild cognitive impairment, and neurodegenerative diseases.

Neuroimaging studies show **modest evidence of macrostructural, microstructural, functional and neurochemical changes in some athletes.**

## MAIN TAKEAWAYS

There is emerging evidence that some retired athletes have mild cognitive impairment, neuroimaging abnormalities and differences in brain metabolism disproportionate to their age.

Survey studies reveal that a minority of former collegiate and professional collision sport athletes have depression and/or cognitive decline.

Autopsy cases of former athletes have revealed diverse forms of neuropathology, including irregularly distributed depths of cortical sulci.

Preliminary consensus criteria now exists for defining the neuropathology of CTE.

# SPORT-RELATED CONCUSSION SUBTYPES

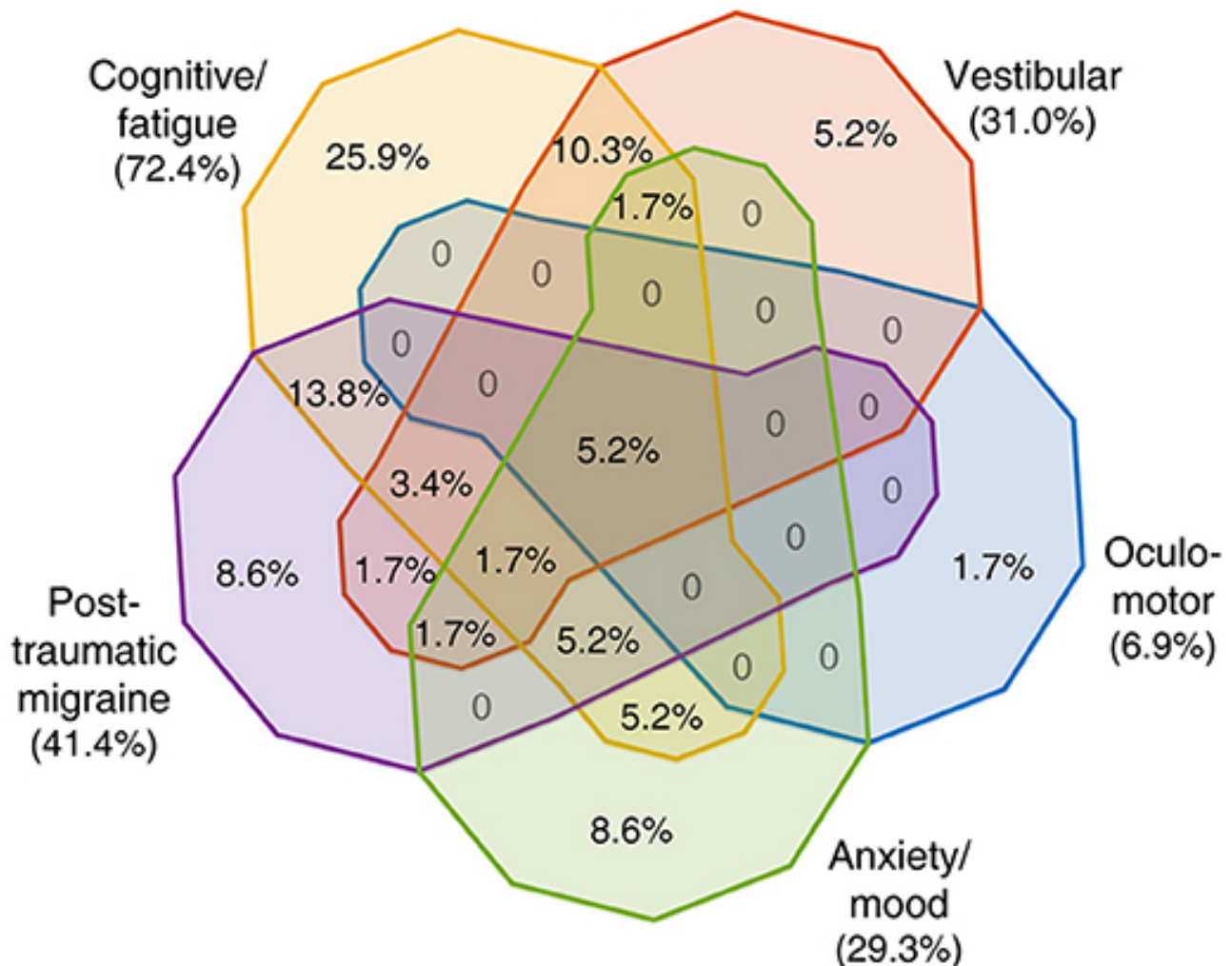
DECEMBER 2022

[Click for Full Text \(Langdon et al. 2020\)](#)

JBI 10/11 [90%]



This systematic review evaluated and integrated all available evidence on the classification of SRC symptoms into clusters.



**22 articles included;** Evidence for the existence of 5 subtypes.

## **Migraine Cluster Symptoms:**

Headache,. Sensitivity to light, Sensitivity to noise, Nausea

## **Cognitive-emotional Cluster Symptoms:**

Difficulty concentrating & remembering, Fogginess, Feeling more emotional, Irritability, Feeling slowed down, Sadness, Nervousness.

## **Sleep-emotional Cluster Symptoms:**

Trouble falling asleep,. Sleeping less, Feeling more emotional, Irritability, Sleeping more, Sadness, Nervousness

## **Neurological Cluster Symptoms:**

Blurred vision, Vomiting, Neck pain, Pressure in head, Visual problems, Double vision

## **Undefined feelings Cluster Symptoms:**

"Don't feel right", Confusion

**19 studies found associations between SRC symptom clusters and clinical outcomes.**

# MAIN TAKEAWAYS

There is robust evidence for the existence of SRC symptom subtypes.

There is evidence to support at least 5 SRC clusters.

Clusters mapping to the migraine cluster were most frequently reported in the literature.

There is clinical relevance of SRC symptom subtyping, as each had different symptom associations and clinic outcomes.

# GIVE US YOUR FEEDBACK!

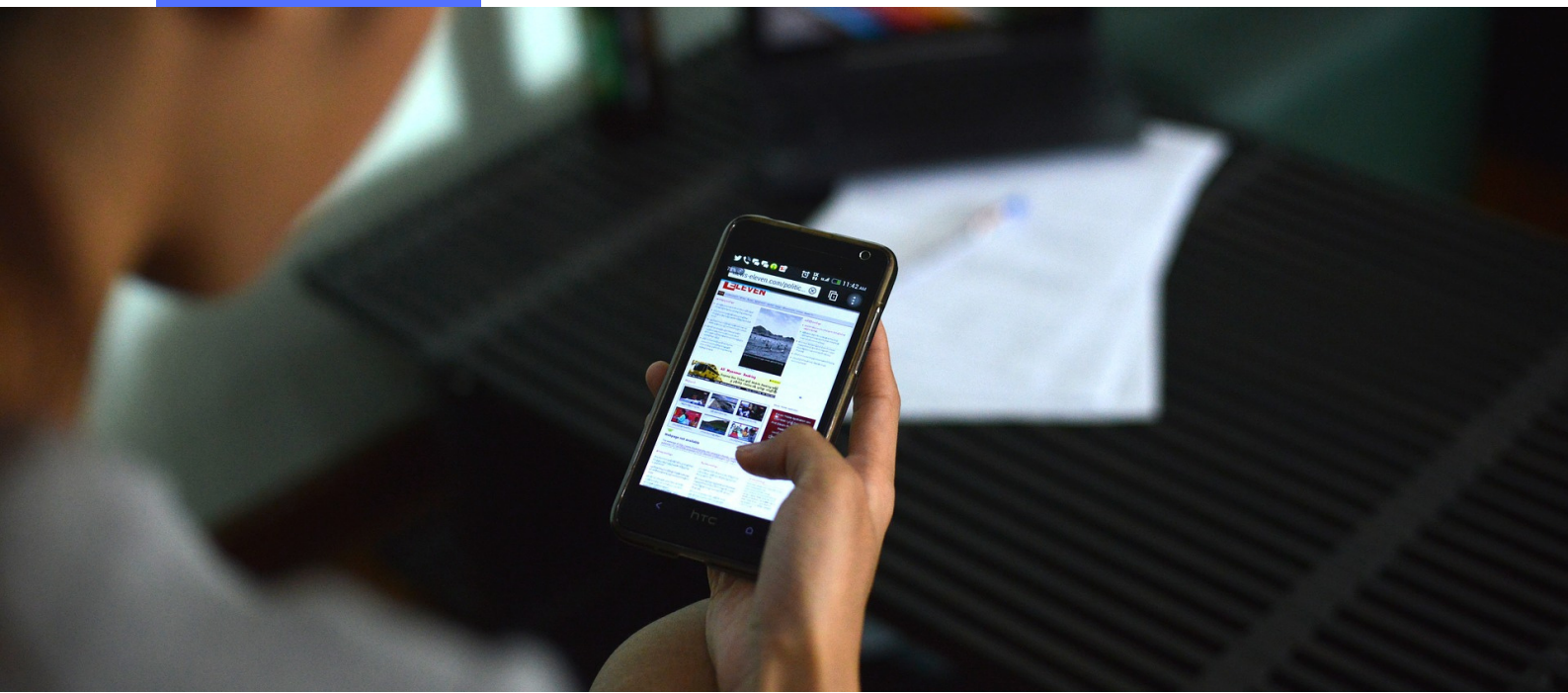
## MEMBERS

We are on a mission to make research more accessible, easier to interpret, and quicker to implement.

Help us by giving 1 minute of your time to leave feedback for us.

We would greatly appreciate any feedback you have, as it helps us continually improve!

[Leave Review](#)





## JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Iverson et al. Year: 2017

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the search strategy appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the sources and resources used to search for studies adequate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were the criteria for appraising studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was critical appraisal conducted by two or more reviewers independently?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were there methods to minimize errors in data extraction?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were the methods used to combine studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was the likelihood of publication bias assessed?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Were recommendations for policy and/or practice supported by the reported data?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were the specific directives for new research appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Overall appraisal: 11/11 (100%)**

LIMITATIONS:

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Did not rate risk of bias or the methodological quality of the articles, just assessed the level of evidence.

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Potential for publication bias in our conclusions because we only reviewed published articles./

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Did not pool data across studies and meta-analyze individual predictors or multiple predictors in combination.

## JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Maney et al. Year: 2017

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the search strategy appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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8. Were the methods used to combine studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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10. Were recommendations for policy and/or practice supported by the reported data?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were the specific directives for new research appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Overall appraisal: 11/11 (100%)**

LIMITATIONS:

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Potential for publication and language bias.

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Could not pool data across studies and meta-analyze risk associations or effect-modifying factors.

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Literature has major methodological limitations overall.

## JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Langdon et al. Year: 2020

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the search strategy appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the sources and resources used to search for studies adequate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were the criteria for appraising studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was critical appraisal conducted by two or more reviewers independently?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were there methods to minimize errors in data extraction?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were the methods used to combine studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was the likelihood of publication bias assessed?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
10. Were recommendations for policy and/or practice supported by the reported data?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were the specific directives for new research appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Overall appraisal: 10/11 (90%)**

LIMITATIONS:

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Only 13.6% of included studies performed explorative data-driven classification of SRC symptom clustering, causing potential analysis bias.

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All studies investigated SRC symptom clustering within the typical phase of recovery (within 1 month post-injury).

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