

**CASP Checklist:** 10 questions to help you make sense of a **Systematic Review**

**How to use this appraisal tool:** Three broad issues need to be considered when appraising a systematic review study:

- ▶ Are the results of the study valid? (Section A)
- ▶ What are the results? (Section B)
- ▶ Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

**About:** These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

**Referencing:** we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference:

Murray DA, Meldrum D, Lennon O. Can vestibular rehabilitation exercises help patients with concussion? A systematic review of efficacy, prescription and progression patterns. *British Journal of Sports Medicine* 2017;**51**:442-451.

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes	X
Can't Tell	
No	

HINT: An issue can be 'focused' In terms of

- the population studied
- the intervention given
- the outcome considered

Comments:

1) Does VR post-concussion improve: (a) subjective reports of dizziness and vertigo, (b) gaze stabilization deficits, (c) balance impairment, (d) gait impairment?  
2) Does VR facilitate early return to sport/work?

2. Did the authors look for the right type of papers?

Yes	x
Can't Tell	
No	

HINT: 'The best sort of studies' would

- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

-Selection criteria: article/abstract original research, population of patients with concussion/mTBI with vestibular symptoms, interventions detailing VRT, measurement of outcomes pre-VRT and post-VRT.  
-Systematic search and review was performed using the PRISMA guidelines.  
-They didn't set a date limit or a study of methodology. They were hoping for a more comprehensive overview of the best available evidence.

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes	
Can't Tell	X
No	

HINT: Look for

- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

-Limits of English language and human studies

-Databases (May 2015): PubMed (1949-2015), CINAHL (1982-2015), EMBASE (1947-2015), SPORTdiscuss (1985-2015), Web of Science (1945-2015) and PEDRO (1999-2015)  
-Reference lists retrieved from articles and guideline documents were screened for additional relevant articles, publications, posters, abstracts and conference proceedings

4. Did the review's authors do enough to assess quality of the included studies?

Yes	
Can't Tell	x
No	

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

-The risk of bias was evaluated by two reviewers  
-RCTs: Cochrane Risk of Bias tool for randomised controlled trails  
-Observational studies (co-hort, case-control, cross-sectional) and Case studies: Effective Public Health Practice Project Quality Assessment Tool  
-Alternative study methodologies: Sackett's initial rules of evidence

5. If the results of the review have been combined, was it reasonable to do so?

Yes	
Can't Tell	
No	x

HINT: Consider whether

- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

-Meta-analysis was not performed  
-Authors reported not done due to the variation in study methodology and outcome measures

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider

- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

- 7 of the 10 articles had a high risk of bias
- Level of evidence supporting VRT in concussion/mTBI would low using Sackett's criteria
- Highest level of evidence with low bias – 2 treatments included – VRT and cervical spine physiotherapy
- This literature is low in abundance, but the existing studies suggest a use for VRT in patients with mTBI/concussion experiencing vertigo and/or balance impairments
- Optimal time to begin treatment following injury still unclear
- Lack of standardization across studies when it came to prescription and progression of exercises
- Best article in utilizing FITT criteria was Alsalaheen et al.
- There is a high need for high-quality RCTs to definitively evaluate effects of VRT on patients with concussion/mTBI with persistent vestibular and/or balance dysfunctions

7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:

- Not given

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes	<input type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern
  - your local setting is likely to differ much from that of the review

Comments:

- Adults and children were in the study
- Males and females were participants
- Military personal
- Sports related concussions

9. Were all important outcomes considered?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider whether
- there is other information you would like to have seen

Comments:

- ABC scale
- DHI score

-FGA score  
 -TUG  
 -SOT  
 -FTST  
 -Dizziness severity score  
 -Likert scale  
 -ImPACT screening tool  
 -DVA  
 -VOR testing  
 -BESS  
 -Return to work  
 -HiMAT  
 \*Most studies were to trying to assess functional outcomes along with self-reports for symptom severity

10. Are the benefits worth the harms and costs?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

**HINT: Consider**  
 • even if this is not addressed by the review, what do **you** think?

Comments:

-The limited studies available do suggest benefit and no adverse effects have thus far been associated with VRT treatment within this population.