

# Does the use of compensatory cognitive strategies improve employment outcomes in people with an acquired brain impairment?

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## *Clinical Question*

“Does the use of compensatory cognitive strategies improve employment outcomes in people with and acquired brain impairment?”

## *Clinical Scenario*

Compensatory cognitive strategies (eg memory retraining, planning and organisation skills) are often recommended and used as part of a vocational rehabilitation program for individuals with acquired brain impairment (ABI). What is the effectiveness of this type of intervention in resulting in improved employment outcomes for this population?

## *Summary of Key Findings*

- No studies were located that looked at the direct impact of the use of cognitive strategies/rehabilitation solely on return to employment.
- The reviewed studies regarded employment as only one of the possible functional outcomes of intervention.
- Nine articles were located that met the inclusion/exclusion criteria
- Four Systematic Reviews (SR) were appraised.

## *Clinical Bottom line*

Currently, there is no published evidence that demonstrates that the use of compensatory cognitive strategies improves employment outcomes in people with acquired brain impairment

In regards to other functional outcomes, however, there are:

1. High levels of evidence that support the use of compensatory cognitive devices (diaries, notebooks, etc) in people with TBI, to reduce incidents of memory failure.
2. High levels of evidence that compensatory memory strategies training (eg mnemonics, rehearsal etc) are recommended for individuals with **mild memory** impairments from TBI.

3. High levels of evidence that practice in visual scanning (using large apparatus) improves compensation for visual neglect after right hemisphere stroke, and can translate to everyday activities that require visual scanning.
4. Lower levels of evidence that support other practices eg teaching self-regulation; teaching formal problem solving in individuals with TBI.

Current evidence can neither support nor refute the functional outcome of treating memory deficits or alertness deficits in people who have suffered from a stroke.

### ***Limitations***

This summary of evidence has been individually prepared and has not undergone a process of peer review.

## **Methodology**

### ***Search Strategy***

Using the levels of evidence as defined by the NHMRC (2002), the search strategy aimed to locate the following study designs:

Level I	Systematic Reviews of all relevant randomised controlled trials
Level II	Randomised Controlled trials
Level III	Controlled Trials, cohort or case control analytic studies
Level IV	Comparative studies
Level V	Case Series (either post-test, or pretest/post test).

A search was also conducted for clinical practice guidelines.

### ***Search Terms***

Population:	acquired brain injury; traumatic brain injury; head injury; closed head injury; acquired brain impairment; adults
Intervention:	cognitive strategies; cognitive retraining; memory retraining; memory strategies; attention retraining;
Comparison:	Nil
Outcome:	employment, return to work; outcomes

### ***Sites searched***

- New Zealand Guidelines Group
- National Guidelines Clearinghouse
- UK Guidelines
- Scottish Intercollegiate Guidelines Network
- Cochrane Library
- Database of Abstracts of Reviews of Effectiveness (DARE)
- Effective Health Care Bulletins
- Centre for clinical Effectiveness (Monash University) – Evidence reports
- Joanna Briggs Institute
- Motor Accidents Authority of NSW
- PubMed
- CINAHL

### ***Inclusion/Exclusion Criteria***

#### **Inclusion Criteria**

- Studies published in English
- Studies examining functional outcomes (including employment)
- Studies examining both cognitive compensation techniques; and cognitive treatment techniques
- Studies capturing main diagnostic groups within ABI ie Traumatic Head injury and stroke.

#### **Exclusion Criteria**

- Studies investigating improvement in test scores as a result of cognitive intervention
- Paediatric studies
- Acute care studies
- Instrument development studies

## **RESULTS**

### ***Results of Search***

Nine relevant studies were located and categorised as shown in Table 1

*Table 1. Study designs of articles retrieved by search*

<b>Methodology of Studies retrieved</b>	<b>Number located</b>	<b>Source of Evidence</b>
Evidence based Clinical practice Guidelines	0	Not applicable
Systematic Reviews or Meta analyses	4	Cochrane Database of Systematic Reviews x 2 PubMed x 2
Individual Randomised controlled trial	1	PubMed
Case Series	2	PubMed
Expert opinion without explicit critical appraisal – Consensus statements	2	National Guideline Clearinghouse

### ***Specific Results***

The systematic reviews were the only studies critically appraised for this summary, as they are the highest levels of evidence available. The studies and appraisal findings are summarised in Table 2.

Table 2. Overall Results

Only those findings relevant to the clinical question are reported here

Systematic review	Cognitive Interventions reviewed	Population	Findings
Cicerone, KD et al (2000 )	Attention, awareness, executive function, memory, perception, problems solving, reasoning.	Adult traumatic brain injury; stroke	<p><b>High levels of evidence supported the use of:</b></p> <ul style="list-style-type: none"> <li>▪ Visuospatial rehabilitation ie practice in visual scanning (using apparatus that challenges peripheral vision) improves compensation for visual neglect after <b>right hemisphere stroke</b>, and generalises to other visuospatial, academic, and everyday activities that require visual scanning.</li> <li>▪ Compensatory memory strategy training (internalised ie mnemonics, imagery, rehearsal etc) ; recommended for persons with <b>mild memory impairments from TBI</b>, to reduce the incidence of everyday memory failures</li> </ul> <p><b>Medium levels of evidence recommend the use of:</b></p> <ul style="list-style-type: none"> <li>▪ Training in formal problem solving strategies and their application to everyday situations and functional activities: For persons with stroke or TBI</li> </ul> <p><b>Low levels of evidence suggest the following maybe useful (ie but with unclear clinical certainty) :</b></p> <ul style="list-style-type: none"> <li>▪ Use of memory notebooks or other external aids to facilitate acquisition of specific skills and knowledge. For persons with moderate to severe memory impairments after TBI; should apply directly to functional activities rather than as an attempt to improve memory per se.</li> <li>▪ Verbal self instruction, self questioning, and self monitoring to promote self regulation: for persons deficits in executive functioning after TBI</li> </ul>
Carney, N et al (1999)	Attention; memory and learning; thinking or mental organisation; affect and expression; executive functions	Traumatic Brain injury	<ul style="list-style-type: none"> <li>▪ There is no direct evidence from randomised trials of the effect of cognitive rehabilitation on employment</li> <li>▪ Level 1 evidence indicates that compensatory cognitive devices (notebooks, wristwatches etc) reduce incidents of memory failure in people with TBI</li> <li>▪ In the absence of direct evidence, a causal</li> </ul>

			pathway was considered. This looked at the link between cognitive rehabilitation and intermediate measures of cognition; and subsequent associations between those measures and employment. However, no convincing evidence exists to support this link.
Majid MJ, Lincoln NB, Weyman N (2002)	Cognitive rehabilitation for memory problems	Stroke	<ul style="list-style-type: none"> <li>▪ Cognitive rehabilitation in the treatment of memory deficits following stroke cannot be supported or refuted by results from RCTs</li> </ul>
Lincoln NB, Majid MJ, Weyman, N (2002)	Cognitive rehabilitation for attention deficits (alertness, sustained attention, selective attention, divided attention)	Stroke	<ul style="list-style-type: none"> <li>▪ Cognitive training can improve alertness and sustained attention but there is no evidence that it helps people to do daily activities after stroke.</li> <li>▪ Therefore, the routine use of attentional training cannot be supported or refuted from controlled trials.</li> </ul>

*Table 3: Reviewer Appraisal Comments*

<b>Systematic review</b>	<b>Appraisal</b>
Cicerone KD et al	<ul style="list-style-type: none"> <li>▪ The review had a clearly focussed question</li> <li>▪ Relevant studies were identified mainly from the MEDLINE database, but there was also follow up from reference lists. A total of <b>171</b> studies were reviewed after exclusion/inclusion criteria were applied.</li> <li>▪ Clear, pre-determined strategy used to determine studies. This included use of a scoring system, and at least two assessors.</li> <li>▪ Results presented clearly, and related recommended practice to Levels of Evidence .In other words, the clinical bottom line was evident.</li> </ul>
Carney N et al	<ul style="list-style-type: none"> <li>▪ The review had a clearly focused question</li> <li>▪ Database search included MEDLINE, HealthSTAR, PsycINFO, and Cochrane. Reviewed <b>32</b> articles (after exclusion/inclusion criteria applied) in total.</li> <li>▪ There was no reference to a scoring system, or number of assessors in this Review, but the text refers you to a previous publication that apparently outlines the methods involved.</li> <li>▪ Results were not presented clearly - information presented in tables was not self-explanatory, nor was it explained in the body of the review.</li> <li>▪ The review was unable to give any clear recommendations for practice</li> </ul>
Majid MJ et al (Memory /Stroke)	<ul style="list-style-type: none"> <li>▪ A clearly focussed question was evident</li> <li>▪ Database search included Cochrane Stroke Group Trials Register; MEDLINE, BIDS EMBASE, CINAHL, PSYCHLIT, CLIN PSYCH, SCISEARCH; plus a handsearch of 29 other Journals</li> <li>▪ Two reviewers rated the articles according to the Cochrane collaboration guidelines</li> <li>▪ Only <b>1</b> study was identified which met the inclusion criteria</li> <li>▪ The Review gave a clear outcome of results, but could not support or refute the intervention because the methodology of the single RCT was poor (no details of randomisation, no blinding of assessors). The study itself indicated a very wide</li> </ul>

	confidence interval in relation to the results of the intervention (cognitive treatment for memory deficits)
Lincoln, NB et al (Attention/Stroke)	<ul style="list-style-type: none"> <li>▪ A clearly focussed question was evident</li> <li>▪ Database search included Cochrane Stroke Group Trials Register; MEDLINE, BIDS EMBASE, CINAHL, PSYCHLIT, CLIN PSYCH, SCISEARCH plus a handsearch of 29 other Journals</li> <li>▪ Two reviewers rated the articles according to the Cochrane collaboration guidelines</li> <li>▪ <b>TWO</b> studies met the criteria for inclusion</li> <li>▪ The Review gave a clear outcome of results, but could not support or refute the intervention because the methodologies used were limited (lack of blinding, low samples, poor outcome measures).</li> </ul>

## References

1. National Health and Medical Research Council (2000) How to use the evidence: assessment and application of scientific evidence. Handbook series on preparing clinical practice guidelines. Canberra: Commonwealth of Australia.

## Articles Critically Appraised for this Summary of Evidence

### Level 1 Evidence

1. Carney, N; Chesnut, R; Maynard, H; Mann, N.C; Patterson, P; Helfland, M (1999) Effect of Cognitive Rehabilitation on Outcomes for Persons with Traumatic Brain Injury: A Systematic Review. *J Head Trauma Rehabil* , 14 (3): 277-307
2. Cicerone, KD; Dahlberg, C; Kalmar, K; Langenbahn, DM; Malec, J; Berquist, T; Felicetti, T; Giacino, JT; Harley, JP; Harrington, E; Herzog, J; Kneipp, S; Laatsch, L; Morse, PA (2000) Evidence –Based Cognitive Rehabilitation: Recommendations for Clinical Practice *Arch Phys Med Rehabil* Volume 81, December; 1596-1614
3. Lincoln, NB; Majid, MJ; Weyman, N (2002) Cognitive Rehabilitation for attention deficits following stroke (Cochrane Review). In *The Cochrane Library*, Issue 2. Oxford: Update Software
4. Majid, MJ; Lincoln, NB; Weyman, N. (2002) Cognitive rehabilitation for memory deficits following stroke (Cochrane Review). In: *The Cochrane Library*, Issue 2. Oxford: Update Software