

What are the functional outcomes of Cognitive Remediation Therapy (CRT) in Schizophrenia?

Completed by: Abigail Hayes **Date:** November 2008 **Review Date:** June 2008

Clinical Scenario

There is a growing interest in cognitive deficits, their impact upon function, and cognitive rehabilitation for individuals who have schizophrenia.

Deficits include 'psychomotor speed, working memory, attention and executive skills' (Wexler & Bell, 2005, p.931).

Cognitive rehabilitation can be split into two categories. These are Cognitive Remediation Therapy (CRT) and Cognitive Adaption Therapy (CAT) (Wexler & Bell, 2005).

For the purpose of this clinical question CRT is defined as 'exercises that enhance or restore the defective function' (Wexler & Bell, 2005, p.932). Alternatively, CAT aims to 'enable someone to circumvent a defective cognitive processor' (Wexler & Bell, 2005, p.932).

Questions arise of what is the impact of trying to remediate these cognitive deficits upon functional skills? Are there functional improvements, beyond improvements in neuropsychological assessments?

The most recent, relevant Cochrane review was completed in 2000, and included articles dated up to, and including, 1997. It concluded that data are inconclusive and provide no evidence for or against cognitive rehabilitation as a treatment for schizophrenia` (Hayes, & McGrath, 2000, p.1).

It was felt that due to the progression of research in this area further review was warranted.

Focused clinical question

'What are the functional outcomes of Cognitive Remediation Therapy (CRT) for adults (aged 18-65 years) with schizophrenia?'

Summary of Search, 'Best' Evidence' appraised

A short-list of 10 articles yielded 5 'best evidence' articles to be further reviewed. 4 were Randomized Control Trials (RCTs) and 1 was a meta-analysis of 26 RCTs.

Clinical Bottom Line

Whilst there are promising results for the functional outcomes of CRT for people with schizophrenia, there are variations between interventions and further long-term studies are needed that focus specifically upon functional outcomes.

Please note this Critically Appraised Topic has not been peer-reviewed.

Search strategy overview

Databases	Search Terms	Limits	Dates Completed
Medline	Cog* AND	<ul style="list-style-type: none">• RCT	26/September/08
CINAHL	Remediation AND	<ul style="list-style-type: none">• 2000-2008	Refined on
PsychInfo	Schizophrenia	<ul style="list-style-type: none">• Humans	28/October/08
Cochrane	Cog* AND Training AND Schizophrenia	<ul style="list-style-type: none">• English• Language• Adulthood	

	Rehabilitation, Cognitive AND Remediation AND Schizophrenia (CINAHL) Cog* AND Rehabilitation AND Schizophrenia (Cochrane)		
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Inclusion/Exclusion Criteria

Type of Studies

- Randomized Control Trial (RCT)

Participants

- Include only the disorder of schizophrenia
- Include only adults aged 18-65 years
- Community-based

Interventions

- Exclude drug therapy
- Only include CRT
- Exclude CAT
- Exclude meta-cognition

Outcomes

- Must look at functional outcomes in the article beyond changes in scoring on neuropsychological tests

General

- English language, Dated 2000-2008

Search results

From the articles retrieved, 5 were selected, as being most recent and relevant to the clinical question. In order to critique the 5 'best evidence' articles, the quantitative critical review form and guidelines (Law, Stewart, Pollock, Letts, Bosch & Westmorland, 1998) were used. Due to one article being a meta-analysis (McGurk, 2007b) an additional resource for critiquing a meta-analysis by Greenhalgh (1997) was used.

Table 1: Results of 4 RCTs

	Bell, M. D., Zito, W., Greig, T., & Wexler, B. E. (2008)	Hogarty, G. E., Greenwald, D. P., & Eack, S. M. (2006)	McGurk, S. R., Mueser, K. T., Feldman, K., Wolfe, R., & Pascaris, A. (2007a)	Wykes, T. (2007)
Sample size justified	No	No	No	Yes
Blinded	No	Assumed No	Assumed No	Single-blinded
Random sample	Yes	Yes	Yes	Yes
Samples comparable at baseline	Yes N=72	Unknown N=121	Yes N=44	Similar, symptoms more severe in experimental group N=85
Drop Outs	Yes	Yes	Unknown	Yes
Contamination /Co intervention	Unknown	Unknown	Unknown	Unknown
Informed consent	Yes	Yes	Yes	Yes
Intervention	Neurocognitive Enhancement Therapy (NET) & Vocational services (VOC) vs. VOC only	Cognitive Enhancement Therapy (CET) vs. Enriched Supportive Therapy (EST)	`Thinking Skills for Work Program` & Supported Employment (SE)	CRT vs. Treatment as usual

			vs. SE only	
Outcome Measures	Work hours Employment rates	Multiple tools including 2 developed by investigators	Competitive employment	Wisconsin card sorting task Behavioural assessment of dysexecutive syndrome Wechsler Adult Intelligent Scale III Rosenberg self-esteem questionnaire Positive and negative syndrome scale Social behavioural scale
Replicable	Yes	Intervention – yes Outcomes - unknown	Partly	Yes
Statistical test	Chi-square analyses t-tests Mixed models, repeated measures ANOVAS	Stringent linear trend analysis	Analysis of variance (ANOVA) Chi-square analyses Mann-Whitney U tests	Linear mixed modeling
Focused on Functional Outcomes Only	Yes	No	No (also hospitalisations)	No
Functional outcomes	Work	Social adjustment vocational rehabilitation volunteering, paid	Work	Social behaviour

		employment, social, recreational and therapeutic activity, shopping for basics, managing finances, household cleaning		
Functional Results	Experimental group worked more total hrs, higher employment rates with modest results (p< 0.05)	No impact upon paid work, Experimental group engagement in social, recreation or therapeutic activity significantly higher (p=0.009), engagement in vocational rehabilitation significantly higher (p=0.007), significantly more volunteered (p=0.006). For people who had been ill < 15 yrs, significant impact upon ability to shop for basic needs (p=0.023), marginal impact upon household cleaning (p=0.055), for those who were less psychotic at baseline, better at managing finances (p=0.039)	Experimental group significantly more worked (p<0.001), held more jobs, worked more weeks, worked more hours and earned more wages (p<0.001).	No direct impact of therapy upon social behaviour scores. In using regression, significant effect in improvements in working memory upon social functioning (p=0.03)

Results of meta-analysis

McGurk, S. R., Twamley, E. W., Sitzer, D. I., McHugo, G. J., & Mueser, K. T. (2007b)

Studies Reviewed

This meta-analysis had a clear objective, which was `This study evaluated the effects of cognitive remediation for improving cognitive performance, symptoms and psychosocial functioning in schizophrenia`.

26 studies were reviewed, which met the inclusion criteria of being an RCT of a psychosocial intervention designed to improve cognitive functioning, an assessment of performance with at least one neuropsychological measure with potential to show general effects beyond assessments on trained tasks only, minimum 74% schizophrenia, schizoaffective disorder or schizophreniform, groups means and standard deviations for baseline and post intervention cognitive tests or statistics from which effect could be calculated.

Statistics

Analysis of covariance (ANCOVA), Multivariate analysis of covariance (MANCOVA) and BioSta software (meta-analysis software) were used to analyse results.

Functional Outcomes

N=1151, however only 11/26 studies included functional outcomes. A small-medium effect size was reported for functioning (0.35). Moderator analyses found that CRT had stronger effect sizes when provided in conjunction with psychiatric rehabilitation. CRT that used drill and practice alongside strategy coaching compared to drill and practice only also had stronger effects sizes.

Significant effect was found upon psychosocial functioning e.g. greater improvements in obtaining and working in competitive employment, quality and satisfaction with interpersonal relationships and ability to solve interpersonal problems.

Limitations of meta-analysis

A more thorough review could have been achieved as only Medline and PsychInfo were searched. This could have included CINAHL and a hand-search of references.

There is no evidence of a critical appraisal of used articles except that they were from peer-reviewed journals.

Conclusions from original author

The study concludes that CRT may have an important role to play in improving cognitive performance and functional outcome in schizophrenia.

Summary and implications for practice

The identified functional outcomes for CRT are in psychosocial functioning i.e. work, quality and satisfaction with interpersonal relationships, ability to solve interpersonal problems, engagement with social, recreation and therapeutic activities, vocational rehabilitation and volunteering. For sub-groups there were improvements in shopping for basic needs, managing finances and marginal improvement in household cleaning.

Results are promising around using CRT in conjunction with psychiatric rehabilitation and in using strategy coaching alongside drill and practice exercises.

At this time strength of results may not warrant full implementation of CRT within mental health services. Currently, it may be useful to consider elements that are usable, such as in the `Thinking Skills for Work Program` (McGurk et.al, 2007) where job loss analysis took place to identify strategies for compensating for cognitive difficulties in the job.

Considerations and implications for future practice, education and future research

- CRT can be very costly.
- Currently there is little consistency in CRT interventions described within studies.
- It is not clear which elements of CRT are effective.
- Few studies focused explicitly on function, except for the field of work.
- Therapists within the literature have been psychologists and so consideration should be given to training requirements.
- It is consistently identified within articles that the goal of CRT is to improve functional outcomes and larger scale studies are needed to achieve this goal.
- Consider the possible `lag` effect upon functioning. In Hogarty et al. (2006) improvements in processing speed and neurocognition from cognitive training in the 1st 6 months persisted for the next 2 ½ years and mediated subsequent social cognition and social adjustment outcomes.
- With the above consideration, longer term studies will be required. Kurtz (2007) reports a study is currently underway to identify a link between improvements in neurocognitive and community functioning.
- Explore other cognitive focused techniques, such a CAT and metacognition.
- Explore other areas, such as impact of neurocognitive deficits upon function and cortisol upon cognition, as a possible cognitive rehabilitation strategy.

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