

Cognitive Remediation Therapy

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Cognitive Remediation Therapy (CRT) is a cognitive rehabilitation therapy developed at King's College in London designed to improve neurocognitive abilities such as attention, working memory, cognitive flexibility and planning, and executive functioning which leads to improved social functioning.

CRT has been used in the treatment of schizophrenia with positive results. In studies conducted at Kings College London with adults with anorexia nervosa CRT was shown to be beneficial in treatment, and in Poland among adolescents with anorexia nervosa, in the United States clinical trials are still being conducted by the National Institute of Mental Health on adolescents age 10-17 and Stanford University in subjects over 16 as a conjunctive therapy with Cognitive behavioral therapy.

CRT has also been shown to be useful in both children and adults with ADHD., as well as for cognitive deficits associated with Major depressive disorder CRT has also been used in a subset of pediatric cancer survivors who experienced cognitive impairment due to the effects of cancer or cancer treatment on cognitive functioning. Clinical trials are slated to begin in 2010 in the United States by the National Institute of Health and the National Institute of Drug Abuse on the efficacy of cognitive remediation upon the cognitive deficits associated with drug abuse.

CRT is usually administered via use of a computer, with the tasks appearing on the monitor.

Neuropsychological tasks

Cognitive flexibility

Naming the color of the first set of words is easier and quicker than the second.

Hayling Sentence Completion Task (Burgess & Shallice, 1996): is a measure of response initiation and response suppression. It consists of two sets of 15 sentences each having the last word missing. In the first section the examiner reads each sentence aloud and the participant has to simply complete the sentences, yielding a simple measure of response initiation speed. The second part of the Hayling requires subjects to complete a sentence with a nonsense ending word (and suppress a sensible one), giving measures of response suppression ability and thinking time.

Controlled Oral Word Fluency Test (Spreen & Benton, 1977). Used for assessing verbal fluency and how easily a person can think of words that begin with a specific letter.

Stroop Neuropsychological Screening Test (Trenerry et al, 1989). Used to test for neurological deficits, ages 18-79. Consists of two parts. The Color Task, consists of a list of 112 color names, printed in a different color, the subject repeats the color name. In the Color-Word Task, the subject names the color of ink in which the color names are printed.

Memory

Visual span: subjects are required to reproduce increasingly complex figures presented on a grid

from memory. The key measure is the highest level at which two out of four figures are correctly recalled.

Sentence span: based on the Daneman & Carpenter (1980) Sentence Span task. Groups of sentences are read to the subject, who then must recall the last word of each sentence. With each subsequent group the number of sentences is increased.

Digit span: from the Wechsler Adult Intelligence Scale -- Revised (Wechsler, 1981). Digit span is the longest list of numbers that a person can repeat back in correct order immediately after presentation on 50% of all trials.

Dual Span (Della Sala et al, 1995): measures Baddeley's (1986) conception of working memory as the ability to process two tasks simultaneously (tracking and remembering numbers).

Cognitive activation tasks

Two back n-back task

A Q R Q Z V Z D X D L P L

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Working memory condition (task) using the "Two back n-back task" The subject is presented with a sequence of letters on a computer screen; the task consists of indicating when the current letter matches the one from 2 steps earlier in the sequence this requires subjects to keep a current record of the previous two letters and to compare the present letter on the screen with that occurring two before. Example: the red letters correspond to the blue letters, which are "two back".

Vigilance condition (look for X): subjects view a series of letters presented in alphabetical order and indicate when the letter X appears out of sequence (e.g. A--B--X).

Baseline condition: for this, subjects simply view a blank screen.

A message on the screen ('Look for X' or 'Task') appears and subjects are asked to say each letter (subvocally) as it appears on the screen in both the vigilance and working memory conditions. The letters appear at the rate of (one every 1.2 s) and the frequency of target responses (two or three in each 15-letter epoch) are the same in the vigilance and working memory conditions. Both of these tasks require the subject to pay attention to the screen.