

Cogmed Working Memory Training

Overview

What is Cogmed Working Memory Training?

The core cognitive deficit in ADHD is inadequate working memory capacity. In landmark research at the Karolinska Institute in Sweden, Dr. Torkel Klingberg and colleagues have developed an evidence-based training program, proven to effectively expand working memory capacity in a sustained fashion. This groundbreaking program is publically available as Cogmed Working Memory Training.

Working memory is the brain system responsible for active manipulation of information from both current areas of focus, and long-term memory sets. The function of working memory is similar to RAM in a computer. Deficits in either working memory, or RAM, quickly lead to problems in analyzing information, and an inability to run multiple programs concurrently.

While this deficit in working memory capacity has been known for decades, conventional wisdom held that the basic capacity could not be changed. As a consequence, interventions in ADHD, and other working memory disorders, have focused on compensating with medications, and behavior strategies, rather than treating the underlying deficit.

In his seminal 2002 study, Dr. Torkel Klingberg, and colleagues at the Karolinska Institute in Sweden, disproved this conventional wisdom by demonstrating that an intensive, computer-based training program could significantly expand working memory capacity in a sustained and effective fashion. The training program takes advantage of the brain's ability to repair, rebuild, and strengthen cells and systems to increase working memory capacity.

The exercises which comprise the [Cogmed Working Memory Training](#) program are designed to challenge specific working memory skills. A complex internal adjustment algorithm is used to maintain a level of challenge that adapts to each correct and incorrect trial. This latter feature plays a central role in signaling the brain that it needs to expand the capacity of the working memory system.

Dr. Klingberg's lab has both replicated the clinical efficacy of the program, and continued to pursue cutting-edge research focused on identifying the physiologic changes created by the program (*Science* 2009). [Cogmed Working Memory Training](#) has also been independently validated at a number of leading institutions.

Information on current and past studies can be found at www.chapelhillpa.com/cogmed.htm under the section "Peer-Reviewed Research"

Who is Cogmed Working Memory Training for?

It is for adults and children whose deficits in working memory are having a negative impact on their lives. This is most likely true for people with:

- ADHD
- Age-related decline in working memory
- Brain injury or stroke
- Cancer
- Primary deficits in working memory which often accompany learning disabilities
- School children with low working memory regardless of the cause

There are also studies showing that people without working memory deficits can improve their working memory.

Young adults with normal working memory

Preschool students with normal working memory

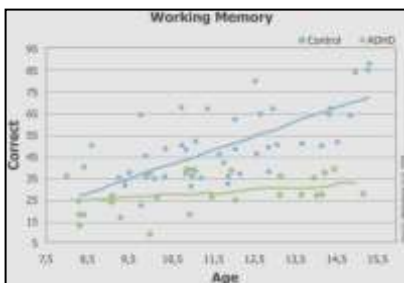
What is working memory? – Condensed from Klingberg’s “Training of Working Memory” (April 2008)

“Working memory is the ability to keep information online for a brief period of time, which is essential for many complex cognitive tasks such as reading comprehension, problem solving and control of attention...”

“Verbal working memory is necessary for comprehending long sentences; and... predicts performance on reading comprehension in the scholastic aptitude test (SAT). Working memory is also important for control of attention, and to maintain task-relevant information during problem solving... *Working memory has been suggested to be the single most important factor in determining general intellectual ability.*

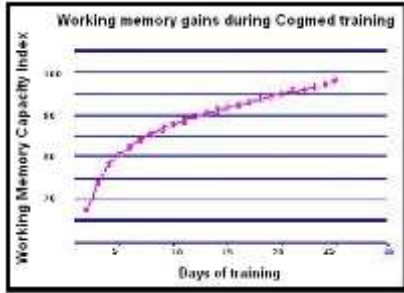
“There is a strong link between working memory capacity and the ability to resist distractions and irrelevant information... Low working memory is related to being “off-task” ...daydreaming, (and) forgetting what to do in the few seconds of walking from one room to the another...”

Working Memory Deficits and ADHD



ADHD is characterized by a failure to obtain normal age-related gains in working memory. This graph shows the growing discrepancy between students with ADHD and their peers. This failure to achieve maturational gains is thought to be one of the major reasons ADHD students have progressively greater difficulty compensating for the disorder.

Cogmed Working Memory Training has repeatedly been shown to result in statistically significant improvements in working memory with subsequent gains in other executive functions, behavioral measures and academic performance.



**AVERAGE IMPROVEMENT IN WORKING
MEMORY FOR 450 CHILDREN
ACROSS 25 DAYS OF
COGMED WORKING MEMORY TRAINING**

2) School children with low working memory

Children with low working memory commonly struggle to keep up with the academic challenges of school. Many of these children have diagnosed learning disabilities. A recent study showed that children who tested in the bottom 15% on working memory assessments were able to largely normalize their working memory capacity after five weeks of Cogmed training. Six months later, these students were showing significant improvement in math.

3) Normal Aging

For adults, normal aging is associated with a 5 to 10% decline in working memory every decade. Cogmed training has been shown to improve working memory and to result in improved self-reported cognitive functioning.

Cogmed training has been shown to improve working memory in older adults, ages 60 to 70 years, and to result in decreased reports of cognitive problems.

4) Stroke

Significant decreases in working memory are common following stroke. These changes are correlated not only with memory and attention problems, but have been shown to predict the extent of recovery of motor function. Cogmed training has been shown to significantly increase working memory and attention, and to decrease cognitive problems.

Is Cogmed Working Memory Training appropriate for children?

Yes, even preschool children may benefit from increasing their working memory via Cogmed training. Young children benefit the most when there is direct adult supervision of training.

8 out of 10 children show measurable improvement

- Improved ability to sustain attention
- Improved impulse control
- Better complex reasoning skills
- Better academic performance

How is **Cogmed Working Memory Training** structured?

Initial Contact – Dr. Ware is available by phone and/or email to answer questions regarding training, and whether **Cogmed Working Memory Training** would be an appropriate option for you or your child.

Start-up session – Once you have committed to the training, the supervising clinician will explain the structure of the program, review the exercises, explain how to access the performance review information, and provide the software for the program. He or she will also provide the system assigned username and password, explain how to access technical support, assist with planning and structuring training, answer any additional questions and provide written documentation of the information that was discussed. **If the trainee is a child, both the child and all adults who will be supervising training must attend the appointment.**

Five to six weeks of training with weekly contact – Training is designed to take place five days per week for five weeks. The specific days and times are decided by the trainee and/or his or her family. When necessary, it is possible to divide one session into multiple sessions, even over multiple days. Supervision is done by monitoring the training data stored on the main server each time the program synchronizes.

Access to the Cogmed training web - Both the trainee (or parent) and supervising clinician will be able to review and monitor the results of each day's training online.

Wrap-up report - After the training is completed, the trainee, or his or her parent, will complete rating scales and questionnaire. This information will be used in the preparation of the wrap up report.

Cogmed Working Memory Training - Extension Training - When the 25 sessions are completed, the trainee or trainee's parent may request an additional five full training days, and/or 100 half-sessions of training to use over a 12-month period. This optional extended training is free, but the original license expires no later than 14 months after start-up.

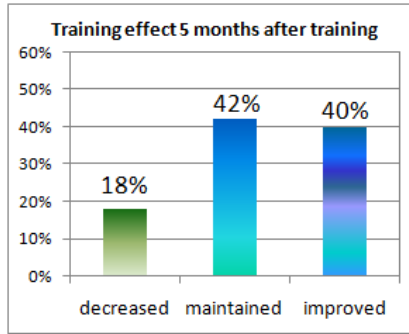
What happens after **Cogmed Working Memory Training**?

Increasing working memory capacity provides the foundation for using and/or building working memory dependent skills. It does not train those skills directly. We recommend that trainees, and/or their parents, consider professional guidance as they work to acquire new skills, to use previously existing skills more consistently, and to eliminate old coping skills that have become barriers to change.

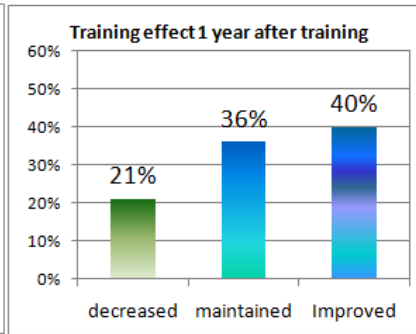
How do I know the benefits will last?

A one-year follow-up analysis of trainees confirms that results are well maintained.

Of the 80% who have benefited from training:



After 5 months, 82% reported maintained or improved benefits



After 1 year, 79% reported maintained or improved benefits

How much does [Cogmed Working Memory Training](#) cost?

CHPA supervising clinicians are all highly experienced licensed mental health providers. While the program pricing is designed to support the use of lay “coaches” or graduate students, it is clear to us that supervision requires expertise with regard to the conditions being treated. Please see the registration packet on the CHPA Cogmed webpage for current fees.

[Cogmed Working Memory Training](#) is done in the home without a provider present and so is not covered by insurance.

All initial training contact and questions should be directed to Dr. Ware at:

Voicemail 919-338-2940 or email twaremd@chapelhillpa.com

Where can I learn more about [Cogmed Working Memory Training](#)?

www.chapelhillpa.com/Cogmed.htm and www.cogmed.com

Cogmed Working Memory Training is not intended to be a substitute for a health care provider’s consultation or a substitute for medication that a doctor may have prescribed. Results may vary. Effects or results in the individual can never be guaranteed.