

Cogmed is now easier to do in schools.

<http://www.cogmed.com/research>

Charles Shinaver PhD & Peter Entwistle PhD

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AGENDA

- Cogmed Distinctiveness
- new features: Trends Reporting for School-age Cogmed (RM)
 - Compliance
 - Motivation
 - Validity
- automated Start-up Sessions
- role of account management
- large scale implementations
- research overview
- demo

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Cogmed Distinctiveness

- Cogmed is Coach Mediated vs. Direct to Consumer approach.
 - Coach Qualification requirement.
- Cogmed Emphasizes the Accumulation of Quality Scientific evidence
 - Careful attention to the evidence.
 - Claims based upon evidence.
 - Claims & Evidence Document updated March, 2016
 - Refereed journal articles & book chapters
 - Marketing is based upon consideration of the evidence.
 - Marketing & Sales are directed toward professionals not consumers.
- Cogmed Training Web Provides resources
- Cogmed Customer Support includes Cogmed Onboarding & Account Management

Features Intended to Address Previous Challenges in Schools

- Time: Previously Standard Protocol: 5 days/5 weeks.
40-50 minutes (children & adults),
15-20 minutes preschoolers.

NOW: Variable Protocol: 3 or 4 days a week.
25 or 35 minutes protocols. 7-10 weeks.

Critical School Related Updates

- Variable Protocols
- Ipad/Tablet version of Cogmed (2014)
- New Training Data User Interface. (2014)
- Demo at login "Try Me" with new URL: mycogmed.com
- Cogmed Trends Reporting Targeted to schools specifically. (2015)
- CPI: Cogmed Progress Indicator
- Cogmed Progress Reports for each student
- Start Up Session Videos

Update v4.60 available 11/15/16.

Timeline

Cogmed v4.6.0 (2016 Q3/Q4 release) is scheduled to be available on all platforms (web, iPad & Android) November 15, 2016. The iPad version could be available at a later time if the Apple App Store review process takes longer than expected.

Summary

- Negative feedback after each trial has been removed
- Improvements to the Space Whack exercise
- **No training exercises on CPI blocks (25-minutes protocol only)**
- Protocol changes for more consistent Start Index calculations
- Improved Cogmed Questionnaire reporting
- Various fixes and improvements

Research rationale for removing negative feedback

After each trial Cogmed's training programs play a sound, a positive sounding one after a correct trial and a negative sounding one after a failed trial.

Broader research has shown that motivation and compliance increase in absence of negative feedback. Our research staff conducted a study on this topic and plan to publish the study soon. The short version is that it did find effective training after removing negative feedback. We look forward to seeing the published study ourselves.

Therefore we have decided to remove the negative sounds after missed trials. All positive feedback has been kept intact and work as usual.

This change will only affect trainings created after the v4.6 release.

Improved Cogmed Questionnaire reporting

In the current version of the Cogmed Questionnaire we wait until after the last question has been answered before uploading the results to our servers. This means that if a trainee is interrupted while filling out the questionnaire for any reason (Internet problems, closing the browser by accident, etcetera), all the answers will be lost and the trainee will have to redo the whole questionnaire. In v4.6 we will upload the answer to our servers after each answer so if the questionnaire is interrupted for any reason the trainee will be able to continue where he or she left off.

This change will be automatically available for all customers using the 4.6 version.

The Customer Gets to Choose Variable Protocol

25 min. per session*	35 min. per session*	50 min. per session*
5 days per week for 8 weeks	5 days per week for 6 weeks	5 days per week for 5 weeks**
4 days per week for 10 weeks	4 days per week for 8 weeks	4 days per week for 7 weeks
3 days per week for 13 weeks	3 days per week for 10 weeks	3 days per week for 9 weeks

* Indicates total training time including breaks
 ** Standard protocol supported by published peer-reviewed research

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Schedule for coach calls

	25 min	35 min	50 min
CPI Session	Training Day		
CPI baseline 1	1	1	1
CPI baseline 2	2	2	2
	5	5	5
	Coach Call 1	Coach Call 1	Coach Call 1
CPI Day 3	10	10	10
	Coach Call 2	Coach Call 2	Coach Call 2
CPI Day 4	20	17	15
	Coach Call 3	Coach Call 3	Coach Call 3
CPI Day 5	30	23	20
	Coach Call 4	Coach Call 4	Coach Call 4
CPI Day 6	40	30	25
	Coach Call 5	Coach Call 5	Coach Call 5

No training on CPI blocks on 25 minute protocols

Customers have been reporting that for some users CPI blocks take longer than expected for the 25-minutes protocol which we have confirmed by analyzing training time data. To address this and making it more consistent how much training blocks take throughout the training and ultimately making time planning easier, we have removed other activities (training exercises) on CPI blocks.

These change will only affect trainings created after the v4.6 release and only trainings using the 25-minutes protocol.

Basis for Variable Protocols: Analysis of 3,629 protocols of Beta Data

- Pilot results with 70 children training on the shorter versions were promising.
 - **Beta released:** 25 minutes per training block and one of approximately 35 minutes.
 - Data from 3,629 completed Cogmed trainings (**UK, USA, AU, NL**) of RM and QM were used.
- Note:** JM is already very short at only 15 or 20 minutes per training session.
- The data was analyzed to investigate the effects of the new training protocols.

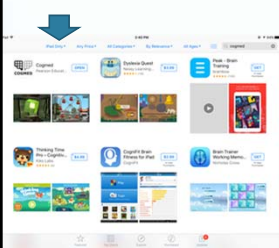
Results of Variable Protocols: Analysis of 3,629 protocols of Beta Data

- No significant differences on the CPI tasks (WM Odd one out, following instructions and math fluency). Measures of generalization.
- Improvements did not vary based upon number of training blocks per week.
- Self-rated improvements in everyday attention were equal across protocols.

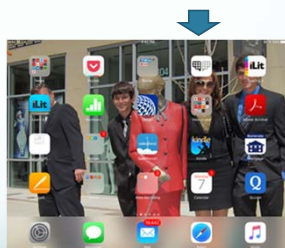
CONCLUSION: Shorter training protocols can be recommended with confidence to users.

UPDATES: iPad Version of Cogmed Downloadable from both the Apple App Store and on Android App on Google Play.

Cogmed on Apple App Store:



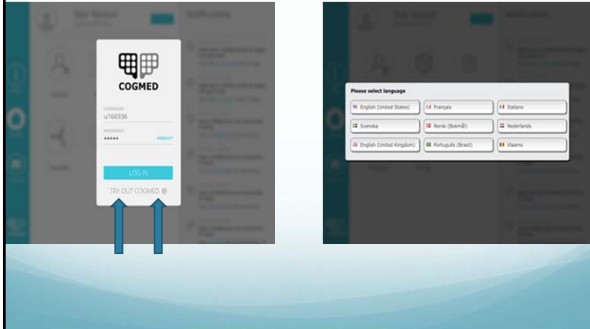
Cogmed on Ipad:



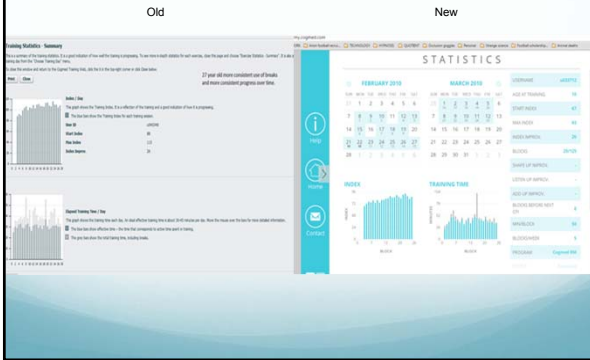
Cogmed on my.cogmed.com: Demo without password.

Demo at login by clicking on: "Try Out Cogmed"
 No password required.
 New Login URL: my.cogmed.com

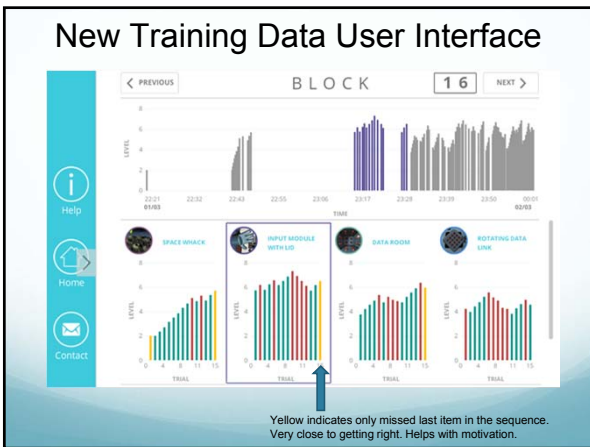
Demo Languages:



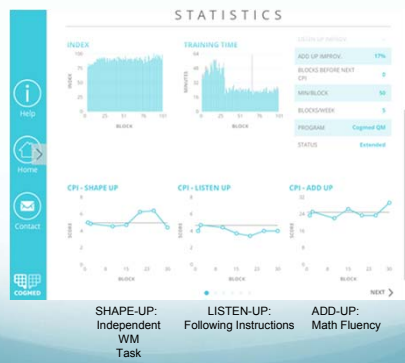
New Training Data User Interface



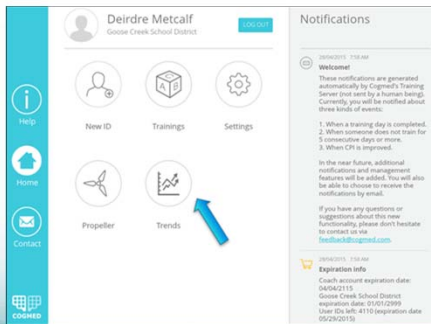
New Training Data User Interface



CPI: Cogmed Progress Indicator: Built-in Measures of Transfer



Trends Reporting



“Trends” Reporting Developed

- Communication: ***Fidelity metrics used during implementation***
- Track fidelity
 - Account level
 - Coach level
 - Individual trainings
- Communicate across accounts and schools
- Ease day-to-day coaching needs

Trends Metrics

- Compliance
 - Training according to Schedule
- Motivation
 - Training with high effort and quality
- Validity
 - Training without indications of disallowed strategies
 - AKA – The “cheating” score

Compliance

Compliance: The number of trainees and percentage of trainees that are following the selected protocol

- Measuring time per block (25, 35, or 50 minutes per bloc)
- Measuring blocks trained per week (3, 4, or 5 blocks completed per week)

Minutes Per Day	Total Number of Sessions/Blocks	Number of weeks to complete
25 minutes per day	40 blocks	13 weeks to complete
35 minutes per day	30 blocks	10 weeks to complete
50 minutes per day	25 blocks	7-8 weeks to complete

Motivation

Motivation: The number of trainees and percentage of trainees that are motivated and completing the program at their capacity.

Based on effort and performance and breaks

- Are they giving the maximum effort?
- Is the student performing below capacity
- How many mandatory breaks are given during an exercise?

Validity

- Does a trainee appear to be using disallowed strategies?
- Discrepancies between highest level of tasks that are easy and difficult to cheat on.
- Unexpectedly steep index improvement.
- Unexpectedly high start index.



Cheating is easy.



Cheating is difficult.

Key Administrative Tools

- Blocks Behind
 - On average, how many blocks behind the selected protocol are the trainings within this account/coach account?
- Trained Blocks
 - On average, how many blocks have the trainings in this account completed?
- Total Started
 - How many trainings have been started within this account?
- Total Created
 - How many training IDs were created within this given account?
- Account Hierarchy
 - Toggle between accounts, subaccounts, coaches, and individual trainings

TRENDS: ACCOUNT

SHOW LATEST: 1 Month 3 Months 6 Months Custom

Goose Creek School...

Account	Compliant	Blocks Behind	Trained Blocks	Motivated	Valid	Total Started	Total Created
Goose Creek School Di...	104 (71.7%)	6.5	19.1	115 (79.3%)	139 (95.9%)	145	278
Alamo Elementary	1 (8.3%)	17.1	6.3	10 (83.3%)	10 (83.3%)	12	19
Ashbel Smith School	16 (100%)	3.6	23.9	10 (62.5%)	16 (100%)	16	18
Austin Elementary	13 (68.4%)	1.8	21.6	16 (84.2%)	19 (100%)	19	23
Banuelos Elementary	6 (100%)	4.4	23.7	5 (83.3%)	6 (100%)	6	6
Baytown Junior	-	-	-	-	-	0	33
Bonnie P. Hopper Prim...	-	-	-	-	-	0	1
Bowie Elementary	5 (62.5%)	1.9	23.1	3 (37.5%)	8 (100%)	8	9
Carver Elementary	13 (81.3%)	9.1	18.2	11 (68.8%)	16 (100%)	16	21
Cedar Bayou Junior	-	-	-	-	-	-	-
Crockett Elementary-1	3 (30%)	11.4	13.2	9 (90%)	10 (100%)	10	13

COGNED

Class Level Data on Trends Report

SHOW LATEST: 1 Month 3 Months 6 Months Custom

Goose Creek School ... > Horace Mann Junior

Horace Mann Junior	10 (83.3%)	3.0	20.4	9 (75%)	11 (91.7%)	12	23
Coach	Compliant	Blocks behind	Average trained blocks	Motivated	Valid	Total Started	Total Created
[REDACTED]	10 (83.3%)	3.0	20.4	9 (75%)	11 (91.7%)	12	23

Student Level Data on Trends Report

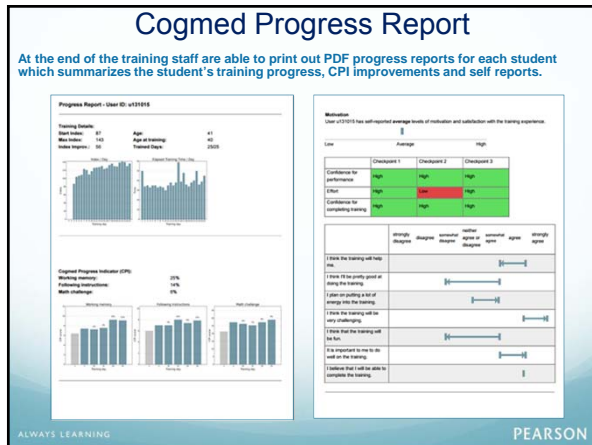
Training	Compliant	Blocks behind	Trained blocks	Motivated	Valid	Status
gc03-88295	✓	1.4	22	✓	✓	Ongoing
gc03-91095	✓	1.4	22	✓	✓	Ongoing
gc03-3001747	✗	11.4	12	✓	✓	Ongoing
gc03-86697	✓	0.4	23	✓	✓	Ongoing
gc03-3009123	✓	0.4	23	✓	✓	Ongoing
gc03-91528	✓	0.4	23	✗	✓	Ongoing
gc03-91768	✓	2.4	21	✓	✓	Ongoing
gc03-84692	✓	0.4	23	✓	✓	Ongoing
gc03-87055	✓	2.4	21	✓	✓	Ongoing
gc03-615948	✗	9.4	14	✗	✗	Ongoing
gc03-99017	✓	3.4	20	✗	✓	Ongoing

Validity Measures on Trends Report

Compliant	Trainee seems to be training according to the plan in terms of time/block and blocks/week.
Motivated	A large portion of the training is performed below the estimated capacity which may impact the effectiveness of the training. Check motivational status and remind them that training at their limits is what will strengthen their working memory!
Valid	Trainee is progressing as expected on the exercises in terms of index improvement.

View Details Training Info Close





Start-up Session

Videos to help you out with presenting Cogmed

- Start Up Session is now fully automated making less work for the teachers.
- These videos educate the students about Cogmed, its effects on users, and how to complete the program in a fun and engaging way. These videos create an understanding and excitement around Cogmed.

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Account Management (MHC & EDU)

Committed Support Throughout Training and Implementation

Onboarding Process:

- Self-guided online training
- Ensuring the use of implementation resources and continuing education
- Address questions and concerns as they come up
- Encouraging continuous communication with our customers

Account Management: Effective in giving customers needed support and sustaining an open line of communication

Understanding Science: Claims & Evidence

• Understanding the scientific method

- Sample sizes
- Type I & II errors.
- Validity and reliability of outcome measures.
- Study design.

• Understanding of levels of evidence from lowest to highest:

- **Testimonials:** *Note: Often direct to consumer models emphasize testimonials to a much greater extent than higher levels of evidence because they "sell".*
- Case studies
- Peer reviewed journals

Claims Evidence Basis

Criteria for forming a claim are as follows (at least one out of the three must be fulfilled):

- An effect is observed in at least two RCTs.
- An effect is observed in at least three controlled studies.
- An effect is observed in one RCT and in two controlled studies

Cogmed Claims & Evidence Claim #1
V.4

- 1) CWMT leads to **sustained improvements in working memory**, from childhood to adulthood (M2, M5), as seen in
 - a) Preschoolers (6, 16, 41, 42, 61)
 - b) Children and Adolescents (1, 3, 7, 13, 18, 25-27, 33, 34, 36, 45, 50, 52, 53, 62, 64, 66, 72)
 - c) Adults and Older Adults (5, 15, 22, 28, 37, 38, 46, 47, 68, 70, 71)

Cogmed Claims & Evidence Claim #2 V.4

- 2) CWMT leads to **sustained improvements in attention** (M3, M5) seen in both:
 - a) **Subjective measures of attention** (3, 11, 14, 18, 38, 31, 47, 66, 72)
 - b) **Objective measures of attention** (5, 6, 15, 22, 25, 28, 66, 72)

Cogmed Claims & Evidence Claim #3 V.4

- 3) Improvements in working memory following CWMT are associated with **changes in functional brain activity**
 - a) seen as changes in the neurochemistry (9)
 - b) functional activity related to working memory (2, 4, 22, 59)
 - c) and functional connectivity at rest (52)

Cogmed Claims & Evidence Claim #4 V.4

4) Learning outcomes in

Reading (13, 35, 45, 69) and

Math (34, 43, 45, 69) improve for many students following CWMT.

Cogmed Claims & Evidence Claim #5 V.4

5) In clinical trials, CWMT has been shown to *improve attentional problems in many with ADHD*

a) as evident in **rating scales** (3, 11, 47, 72)

b) or measured with **objective measures** (25, 72)

Cogmed Claims & Evidence Claim #6-8. V.4

6) Research studies of CWMT report *improved cognitive functioning in daily life* (28, 47, 71, M3, M5)

7) Adults with **acquired brain injury** report *reductions of symptoms* after CWMT in clinical trials (5, 15, 37, 38)

8) *Improvements on measures of cognitive control* have been demonstrated in studies after CWMT (1, 3, 41, 72, M5)

Case Study: Goose Creek, Texas

DISTRICT IMPLEMENTATION:


- Implemented Cogmed in two years across special education departments in 21 district schools.
- 251 students in the fall semester of 2014
- 408 students in the spring of 2015.
- In semester 1, 64% completion percentage.
- **After adding trends**, 94% percent of students completed Cogmed.

POSITIVE INSIGHTS FROM IMPLEMENTATION:

- Close Collaboration with district administration was key to a successful implementation as stated by administrators and teachers
- Variable protocols and Start Up Session Videos made implementation flow easier in the 2014-2015 school year

Goose Creek Consolidated ISD's Success with Cogmed®

Baytown, Texas



- Students trained throughout 21 Elementary and Middle Schools
- 35 minutes a day for 30 days
- Majority of students improved in areas of math, working memory and/or behavior according to Goose Creek Administrators

Dr. Tom Kelchner | Director of Special Education
Goose Creek Consolidated Independent School District | Baytown, Texas

Dr. Tom Kelchner - Director of Special Education
Goose Creek Consolidated Independent School District
| Baytown, TX

Case Study: Ladue School District, St. Louis, Missouri

- **Sample:** 59 students, ages 8 to 17 years (M =12.0, SD = 3.10), from six schools (four elementary, one middle, and one high school) and identified by the District School Psychologist as having a learning disability, executive function deficits, or as struggling academically.
- **Protocol:** 35 minutes per day, 4 to 5 days per week, for 6 to 8 weeks.
- **Fidelity:** 97% of students complied with the Cogmed intervention. 100% of students improved on the exercises practiced throughout the training.

**Case Study:
Ladue School District, St. Louis, Missouri**

Working Memory: 86% of students improved by 37% on the Cogmed Progress Indicator working memory task (Shape Up).

Students significantly improved both on tasks similar to those practiced during training and non-trained working memory tasks from the WOMBAT (Englund et al., 2014).

Following Instructions: 68% of students improved by 20% on the Cogmed Progress Indicator following instructions task (Listen Up).

Behavior: 76% of students improved by an average 43% on parent-rated symptoms of inattention (DSM-IV Rating Scale).

100% of students reported improvement on their own inattentive symptoms (Cogmed Questionnaire).

**Case Study:
Ladue School District, St. Louis, Missouri**

- Students significantly improved on math concepts and applications ($p < 0.05$) and on the math composite score ($p < 0.05$) of the KTEA-II.
- Students in 3rd and 4th grade improved by an average 18 percentage points in math compared to their peers across the state and by an average 23 percentage points compared to their peers nationwide.
- The majority of 3rd and 4th grade students improved on standardized reading assessment, gaining 20 and 23 percentage points compared to their peer across the state and nation respectively.

Take Home

- The findings from the current research suggest that Cogmed Working Memory Training is an efficacious classroom intervention for improving working memory and inattentive symptoms and may be a viable tool for improving academic performance, particularly in math, for students with cognitive deficits and/or struggling academically

**Case Study:
Ladue School District, St. Louis, Missouri**

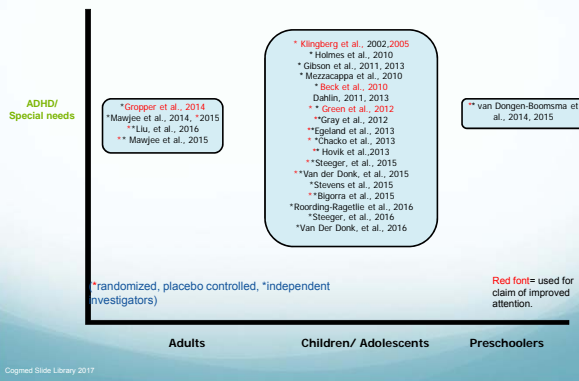
- Students significantly improved their math performance on the KTEA-II and by an average of 16% on the CPI Add Up task after training.
- These gains on the Add Up task are consistent with the overall results of 2,147 Cogmed trainees who improved by 12%.

Whereas students with subjective report of poor WM and attention (Bergman-Nutley & Klingberg, 2014), demonstrated an improvement 14% on the Add Up task.

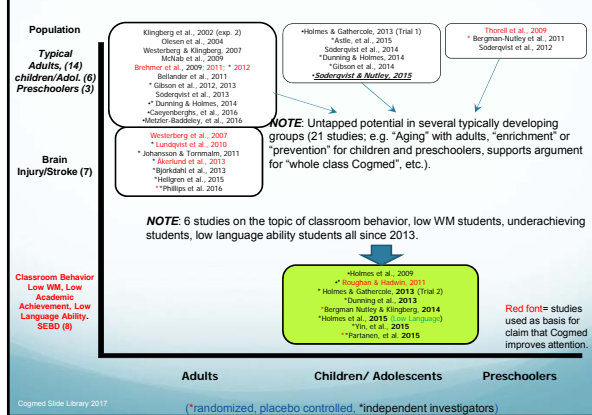
Case Study: Private Practice

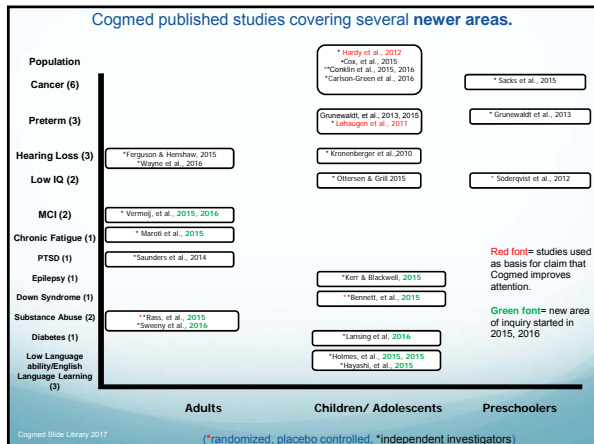
- Practice with five Cogmed coaches.
- Practice was flagged by Cogmed Account Management for low fidelity and compliance.
- Looking further into Trends, it became clear that three coaches were above 90% compliant, but two coaches were below 33% compliant.
- Coaches retrained in Cogmed and compliance was upped back to 90% in all 5 coaches

Over 100 total published Cogmed Studies 28 on ADHD



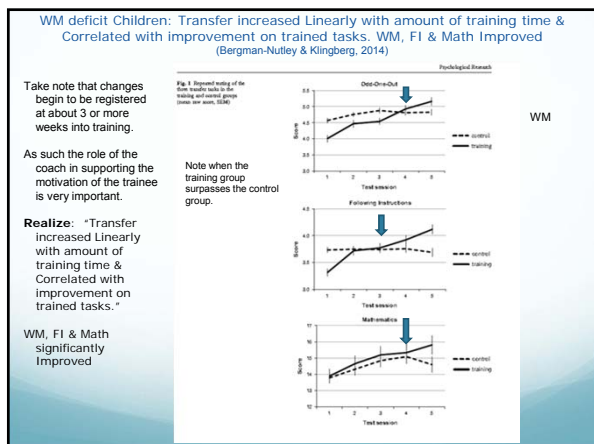
Typically Developing Subjects, Stroke/TBI & Classroom Behaviour.





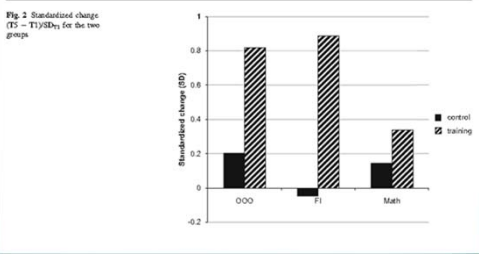
How much time does it take?

How many Cogmed sessions before you can see progress?

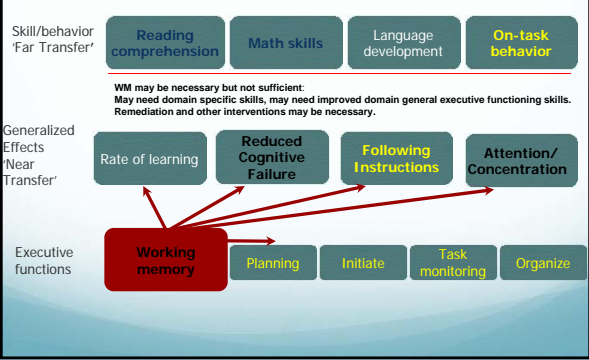


WM deficit Children: Transfer increased Linearly with amount of training time & Correlated with improvement on trained tasks. WM, FI & Math Improved
 (Bergman-Nutley & Klingberg, 2014)

T5 (week 5)-T1 (week 1) showed the biggest difference between groups:

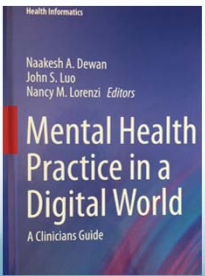


Cogmed: Near & Far Transfer



Book Chapter published by Charles & Peter in
 "Mental Health Practice in a Digital World"
 Our chapter: "Computerized Cognitive Training Based upon Neuroplasticity."

Please [Click Here](#) or go to this URL:
<http://www.springer.com/us/book/9783319141084#>



This chapter puts into the larger perspective computerized cognitive training in the areas in which it has been most applied clinically: Schizophrenia, Traumatic Brain Injury & ADHD.

It is in this chapter where the "severity of disorder" argument is made.

Our Other Publications since 2013

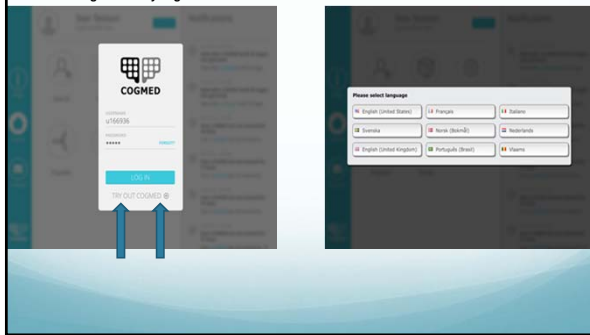
Shinaver, C. S., III, Entwistle, P. C., Soderqvist, S. (2014). **Cogmed Working Memory Training: Reviewing the Reviews**. Applied Neuropsychology: Child.

Entwistle, P.C & Shinaver, C. S. III (2013). **Working Memory Training & Cogmed**. In S. Goldstein, & J. Naglieri (Eds.), *Handbook of Executive Functioning*. New York, NY: Springer.

Cogmed on my.cogmed.com: Demo without password.

Demo at login by clicking on: "Try Out Cogmed"
No password required.
New Login URL: my.cogmed.com

Demo Languages:



Cogmed Coach Training on mycogmed.com & Ongoing Support with Account Management

Cogmed Coach training for School staff takes approximately 3 hours.

Training is at mycogmed.com. (Online & self-paced).

Training is built in packages of 4 or more user ID's.

Ongoing online support with the coach training center at mycogmed.com

Additional support through account management.

Resources

Demo: <http://www.mycogmed.com/>
click on "TRY OUT COGMED"

Website: www.cogmed.com

Research: www.cogmed.com/research
Download Claims & Evidence here

Cogmed Customer Service: 1-800-627-7271

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Thank you!
