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Cogmed: Tools to illustrate and monitor training effects

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How do we measure progress with Cogmed Working Memory Training?

1. Standardised assessments
2. Parent ratings of their child's behaviour
3. Self report measures
4. Teacher ratings of a child's behaviour
5. National curriculum assessments
6. Use Cogmed specific tools
 1. Training Index
 2. Cogmed progress indicator
 3. The Cogmed questionnaire

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Training Index can tell you how a user is progressing

- Based on two exercises; Visual data link (GRID) and Input module with an open/closed lid (NUMBERS)
- Start index is a mean of the three most successful trials on day 2 and 3
- Max index is a mean of the three most successful trials on the two best training days
- Index Improvement is the difference between Start index and Max index

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Training Statistics

Training Details

Trained Days	25 / 25
Age	8
Start Index	64
Max Index	93
Index Improv.	29

The Training Index is a measurement of the progress in the training

Index Improvement is the difference between the Max Index and the Start Index

Normal progress between **14-32** units. The average training has an index improvement of **24**

Show big calendar

Training Statistics - Summary Exercise Statistics - Summary

Choose Training Day ▾

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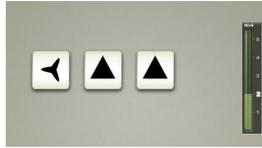
Cogmed progress indicator (CPI)

Purposes:

- 1.Communication** - Quantitative feedback of effects to all parties (end users, coaches, clinicians, parents)
- 2.Knowledge** - Track cognitive change as it occurs
- 3.Validation** - System to monitor future minor changes to training protocol

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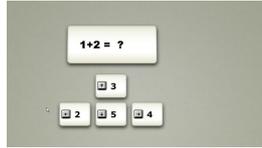
Tasks



Working Memory - Shapes



Following Instructions



Maths

CPI Schedule

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

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CPI Reports

Cogmed Progress Indicator (CPI) - Summary



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Try it out!

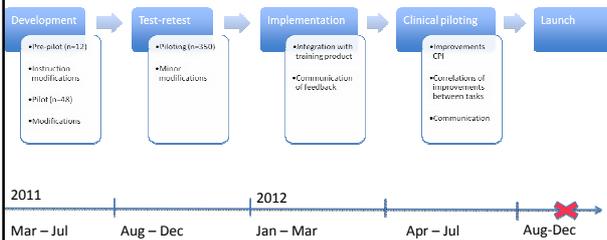
Before you start a training with the CPI, you may want to have a go at it yourself. There is a test account set up on our web site:

- <http://training.cogmed.com>
- **Username: test**
- **Password: testcpi**

Note that it is important that the End-User does not practice on the CPI prior to doing it as part of their training so that we get a baseline that is comparable in terms of practice for all End-Users.

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How was the CPI Developed? Innovation process



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Baseline Pilot

Substantial testing with 350 Swedish children (age range 6-15)

Aims:

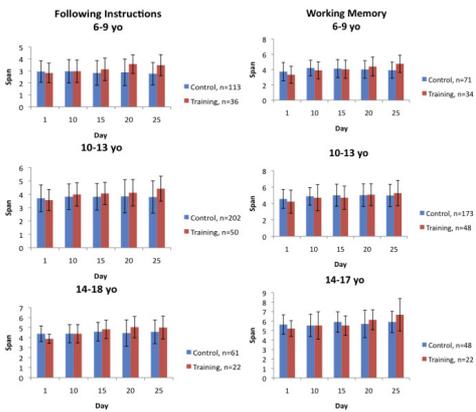
1. Obtain expected improvements on the tasks after 5 sessions over 6 weeks.
2. Ensure reliability and investigate floor and ceiling effects

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Clinical pilot

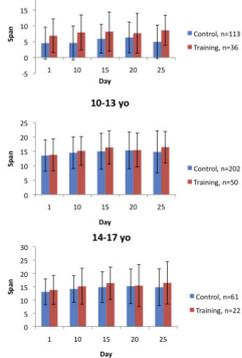
- The CPI was piloted in the US in the clinical setting (n = 175, age range 6-17).

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Math



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Effect Sizes and Percentage Increase

CPI Task	Age group (years)	Effect size	Net %	Gross %
Following Instructions	6-9	0.71	22%	23%
	10-13	0.77	21%	25%
	14-18	1.11	26%	30%
Working Memory (Shapes)	6-9	0.99	31%	37%
	10-13	0.56	14%	19%
	14-18	1.12	24%	29%
Math Challenge	6-9	0.10	-7%	33%
	10-13	0.19	6%	19%
	14-17	0.34	9%	18%

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Statistical analysis

Linear regression with performance at time point 5 as the dependent variable and age, test performance at time point 1 and training condition (yes/no) as the independent variables.

CPI Task	R Square	Beta (training condition)	P-value
Following Instructions	0.33	0.23	<0.001
Working Memory (Shapes)	0.32	0.19	<0.001
Math Challenge	0.65	0.088	0.004

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CPI Conclusion

- Further evidence that Cogmed Working Memory Training is improving working memory related abilities
- Average gross improvement for all ages collapsed was 25% for the Working Memory (Shapes) task and 25% for the Following Instructions task. Similar results to meta-analysis (28% improvement)
- Modest improvements on Maths challenge should be interpreted with caution – more data needed

Document detailing the development of the CPI available on the training web

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The Cogmed Questionnaire

- Already implemented in several countries
- UK early 2014
- 3 sections:
 - Attention in everyday life
 - End user expectations for Cogmed Working Memory Training
 - Goal setting
- Younger users or those who have difficulty reading can be assisted by the coach or another adult
- Appears again at the end of training

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Conclusion

- Important to measure training effects in many ways
- Not every tool will demonstrate improvements with every individual
- CPI database is rapidly growing and we will make information available as we have it
- Cogmed questionnaire in early stages, so only just starting to receive data

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Questions

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