THINC-it: what is it?

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### Disclosures

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**Honorary Professor** at West London Mental Health Trust  
**Principal Consultant** at Metis Cognition Ltd

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<tr>
<td>Research or grants</td>
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<tr>
<td>Speaker Bureaus and CME activities</td>
<td>Lundbeck, Medscape</td>
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<tr>
<td>Royalties</td>
<td>Oxford University Press, Blackwell Publishers</td>
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<td>Patents and share options</td>
<td>MyCognition, Neurotrack</td>
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Cognitive impairment in patients with depression

Magnitude of impairment relative to control (d)

Detection task, Timed chase, GMLT, GMLT-delay, ISLT, ISLT-delay, SECT, Verbal fluency, Stroop test

GMLT, Groton Maze Learning Test; ISLT, International Shopping List Task; SECT, Social Emotional Cognition Test; $d$, Cohen’s d effect size


Clinically relevant
Cognitive symptoms are common in depression

Cognitive symptoms during depressive episodes

- Proportion of time spent without cognitive symptoms: 94%
- Proportion of time spent with cognitive symptoms: 56%

Residual cognitive symptoms in between depressive episodes

- Proportion of time spent without cognitive symptoms: 44%
- Proportion of time spent with cognitive symptoms: 56%

According to Diagnostic and Statistical Manual of Mental Disorders 4th Edition: diminished ability to think or concentrate, or indecisiveness

Prospective study (n=267) assessed 12 times over 3 years

Conradi HJ et al. Psychol Med 2011;41:1165-74
https://www.youtube.com/watch?v=s3ZVRQp2ky0
THINC-it: a proposed solution

- 4 brief, reliable tests of
  - Global cognition
  - Attention
  - Working memory
  - Executive functions

- Non-expert administration
- Simple data reporting

http://thinc.progress.im/en/content/thinc-it-about
https://clinicaltrials.gov/ct2/show/NCT02508493
The following questions describe problems people may have with their memory, attention or concentration. Please select the best response based on your experiences during the **past 7 days**.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never in the past 7 days</th>
<th>Rarely (once or twice)</th>
<th>Sometimes (3 to 5 times)</th>
<th>Often (about once a day)</th>
<th>Very often (more than once a day)</th>
</tr>
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<tbody>
<tr>
<td>Have trouble getting things organised?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Have trouble concentrating on what you were reading?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Forget the date unless you looked it up?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Forget what you talked about after a telephone conversation?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Feel like your mind went totally blank?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
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Key domains: the atoms of cognition

- Episodic memory
- Working memory
- Attention
- Executive functions
  - Psychomotor speed
  - Social cognition
Key domains: the atoms of cognition

- Episodic memory
- Attention
- Working memory
- Executive functions
**Best-practice guidance for assessment of cognition**

<table>
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<th>TESTS MUST BE…</th>
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<tbody>
<tr>
<td>![Tick] RELIABLE</td>
</tr>
<tr>
<td>![Tick] SENSITIVE</td>
</tr>
<tr>
<td>![Tick] VALID</td>
</tr>
<tr>
<td>![Tick] LONGITUDINAL USE</td>
</tr>
<tr>
<td>![Tick] CROSS–CULTURAL USE</td>
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Identifying vs monitoring cognitive dysfunction

Does the patient have cognitive dysfunction?

Has there been a change in cognitive function?

Abnormal | Normal | Decline | Improve
Determining reliable change in individuals

Requires the use of reliable tests

Calculate test stability: within-subject standard deviation (WSD)

Use WSD to plot the confidence interval around test score 1

Test score 1
Confidence interval
Mean

Test score 2
Internal change

Test score 2
No real change

Requires the use of reliable tests
Summary and recommendations

- Cognitive function can be impaired in patients with MDD
- Selected measures must be reliable, sensitive and valid
- THINC-it has been designed to meet ‘best practice’ guidance
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