From Screening to Diagnosis: The Oxford Cognitive Neuropsychology Centre

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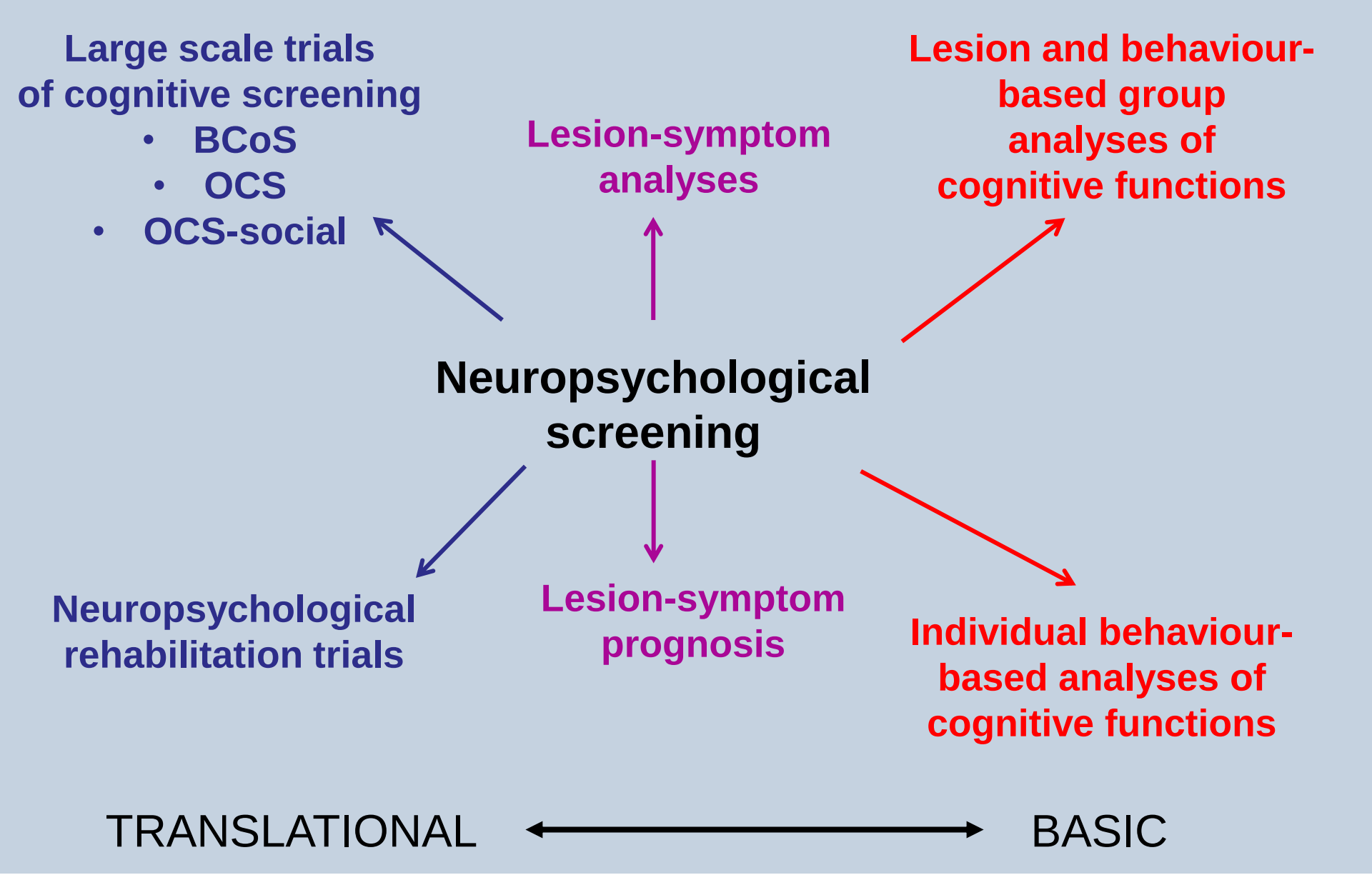

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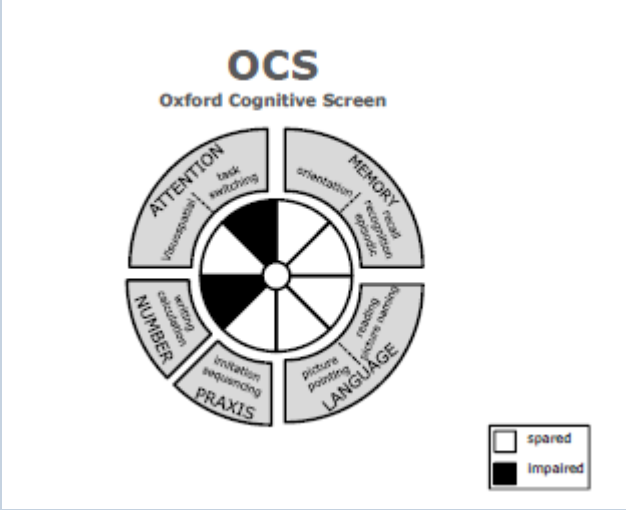
- Tests not set-up for stroke patients and thus often contaminated by problems common in stroke (neglect, apraxia)

- Not always designed to detect problems common after stroke (neglect, apraxia)

- Not always designed to reflect cognitive domains (verbal fluency? executive or language?)

- need tests that are ‘aphasia and neglect friendly’ (uncontaminated)
- that detect common problems after stroke
- that are designed to reflect particular cognitive domains
- that are clinically applicable

- Need for a screen that is ‘broad but shallow’



BCoS - ~ 1 hour OCS - ~ 15 mins

use short high frequency words

use vertical layouts and multi-modal presentations

time efficient design

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Auditory attention test

Words presented at uneven times on MP3 player, respond to no, hello, please but not to yes, goodbye, thanks, across 3 trial blocks

measures:

- **selective attention/response inhibition**
- **sustained attention (across blocks)**
- **working memory (learning & recall of words)**

BCoS trial – 1000 patients across 14 Trusts in the West Midlands

Patients tested within 3 months and post 9 months

HADS, Barthel, NEADL, Apathy

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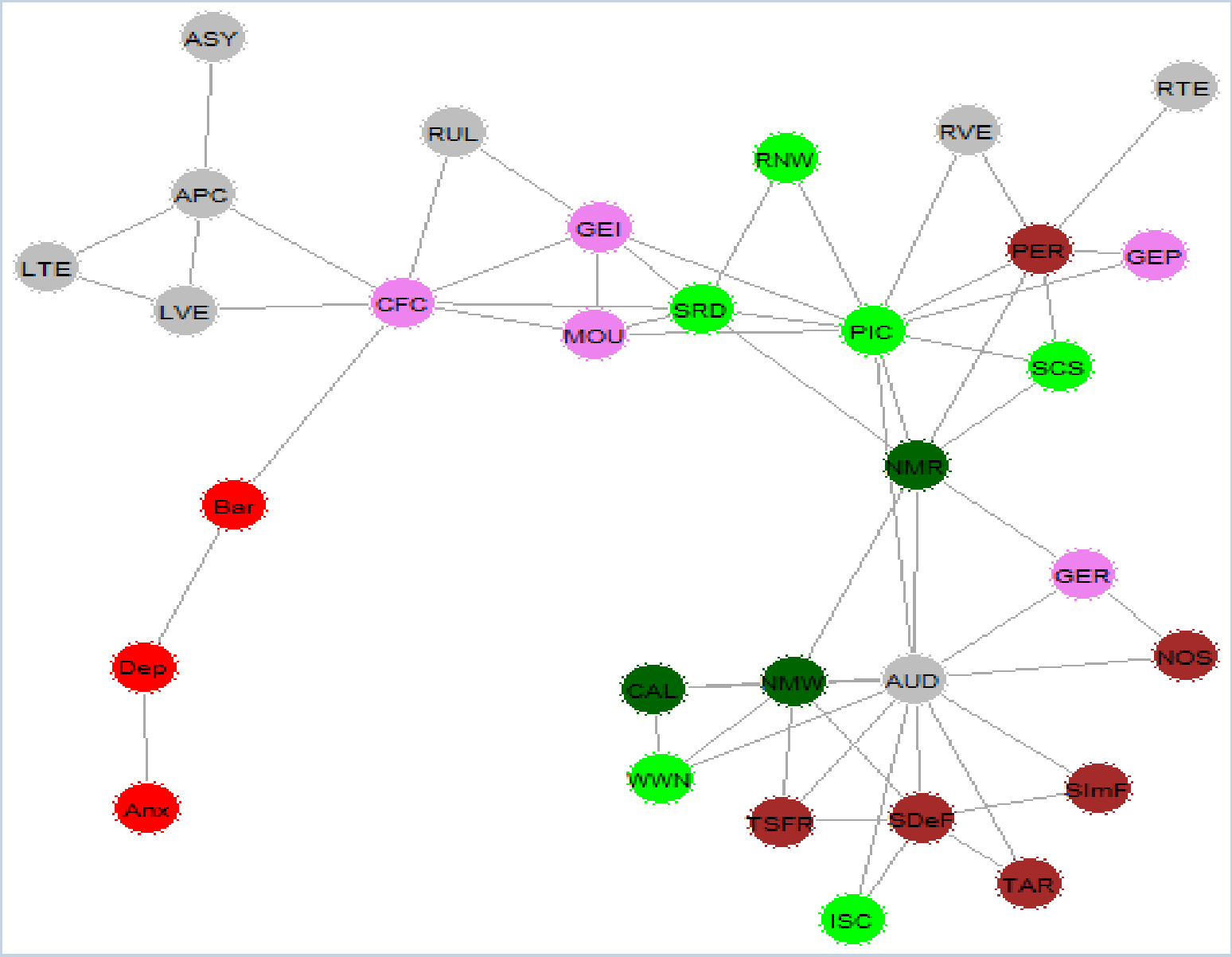

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Domain specificity along with some domain general tests

Functional correlates

80% inclusion rate

Outcome measure at 9 months	NEADL[2]		
N=362	B	SE	β
Initial Barthel	0.45	0.06	0.40**
% BCoS tasks impaired	-2.82	1.30	-0.11*
Apathy at follow up	-0.16	0.03	-0.27**
HADS at follow up	-0.16	0.05	-0.19**
Hemiplegia at follow up	2.34	0.98	0.13*

BCoS inclusive and predictive

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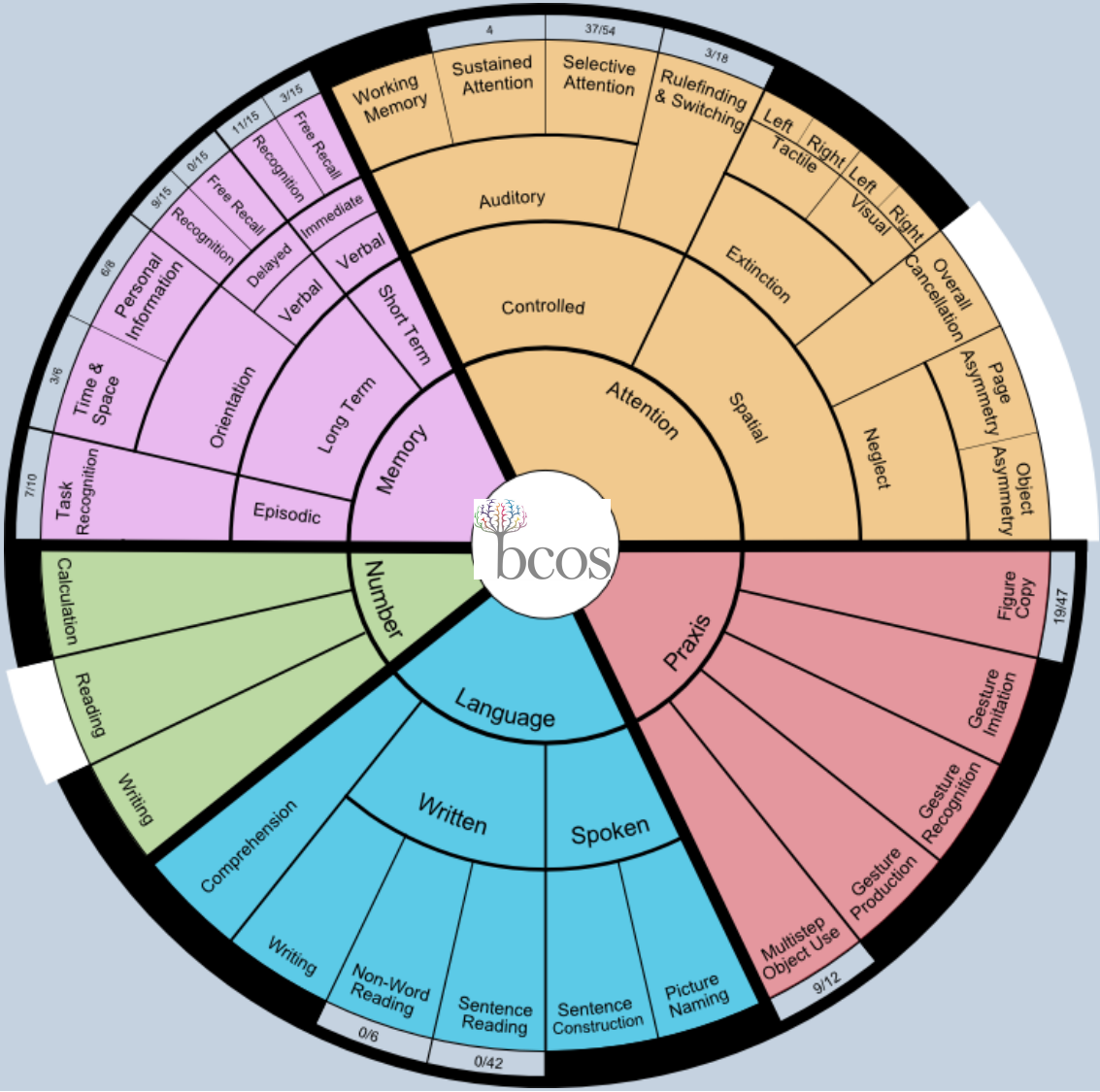

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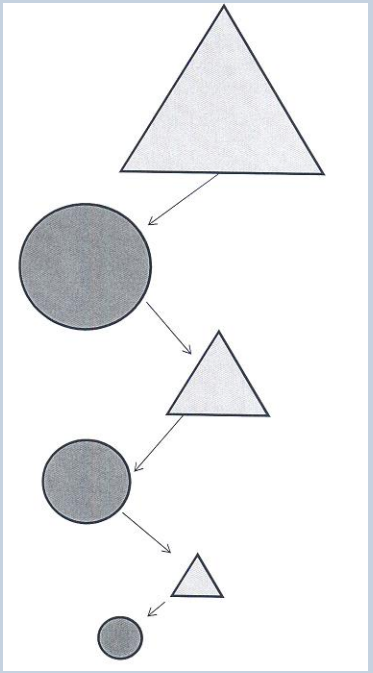
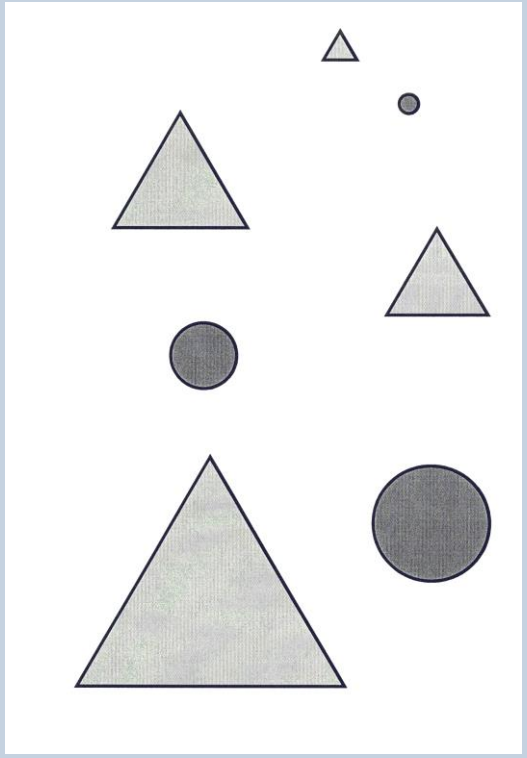
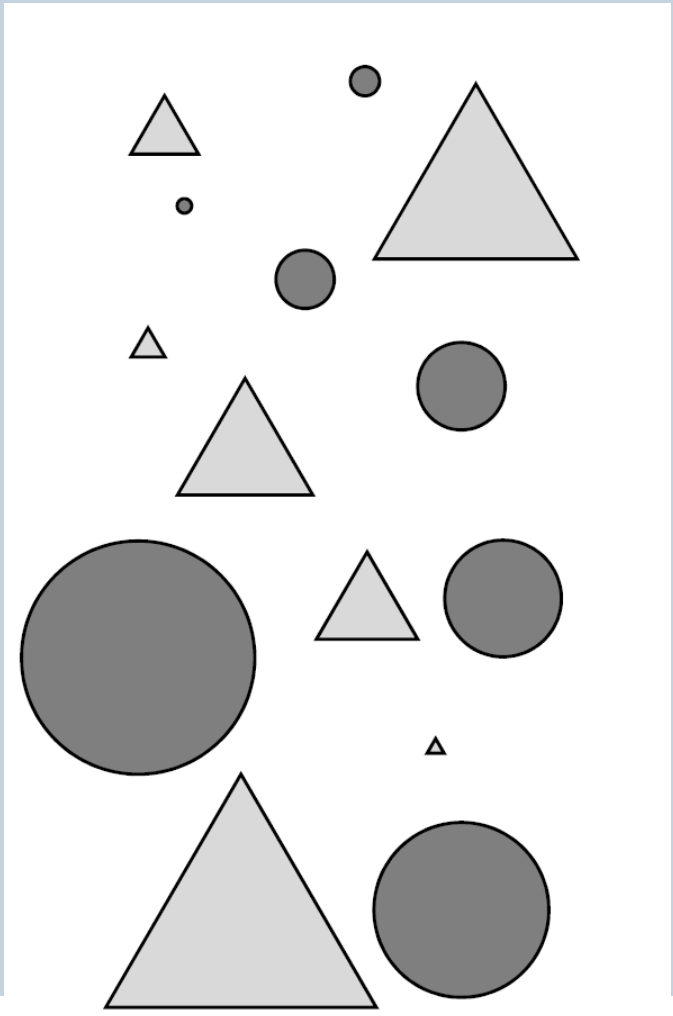
BUT – useful for acute settings?

BCoS-lite: 15 min version, with tests built around the same philosophy

Executive test







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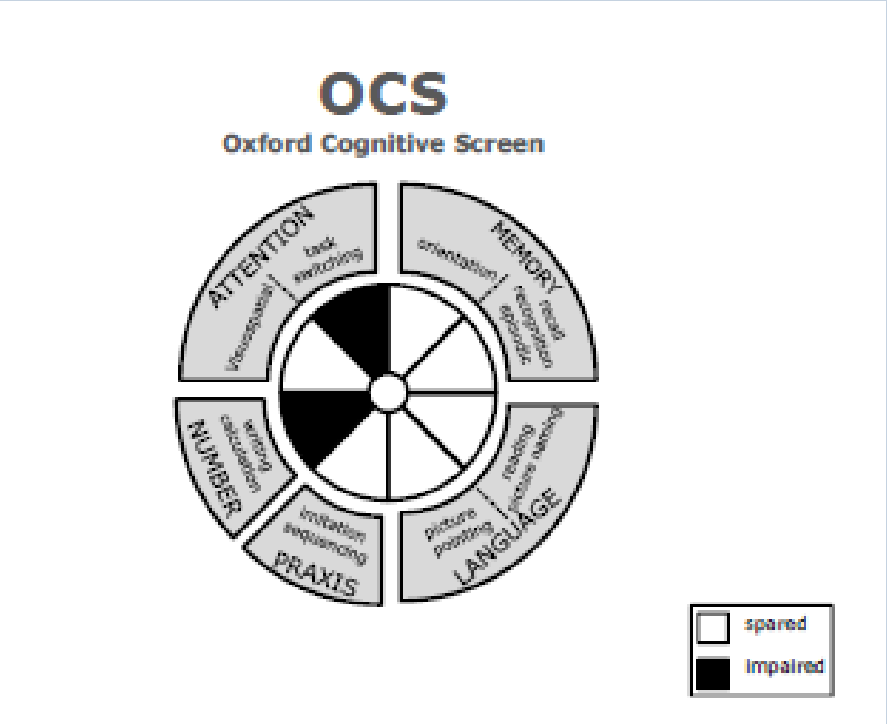
Differences between baseline and switch conditions provides a measure of executive cost and subtracts out problems due to neglect, slow responding per se.



Comparison of BCoS-lite with the Montreal Cognitive Assessment (MOCA) {currently recommended screening tool}

150 acute stroke patients in the John Radcliffe

12% of acute patients score 0 on MOCA due to aphasia
2% only on the lite

Contamination by neglect: example from the trails test

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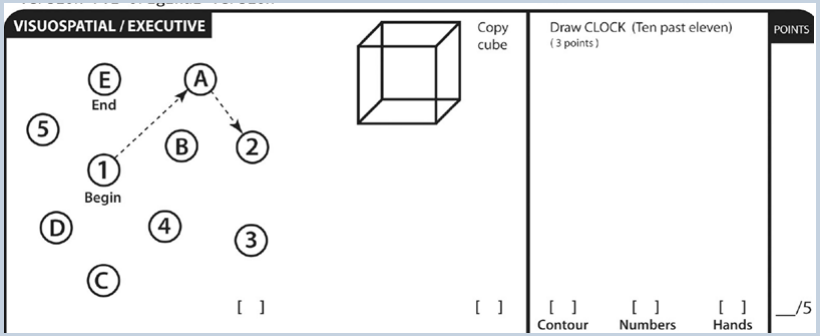
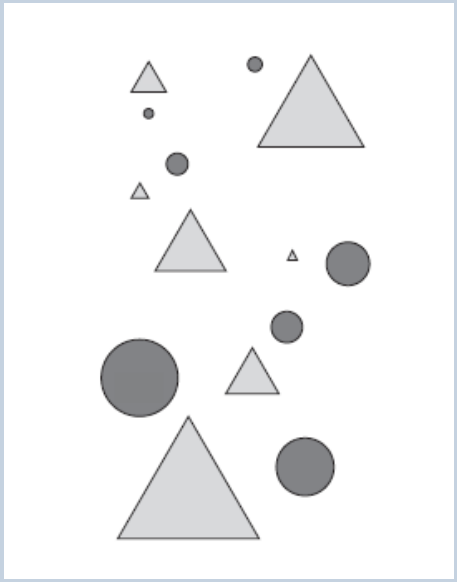
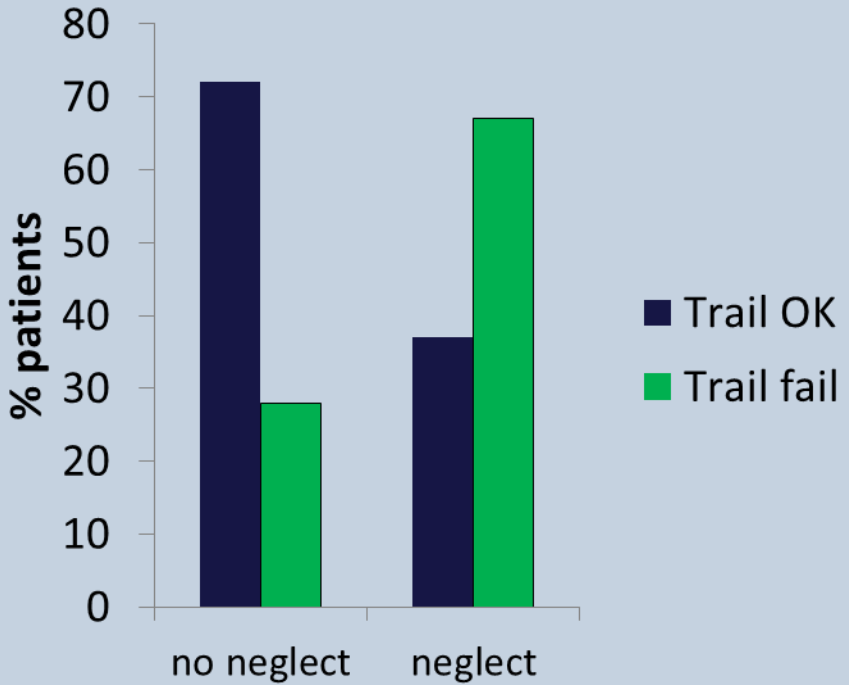
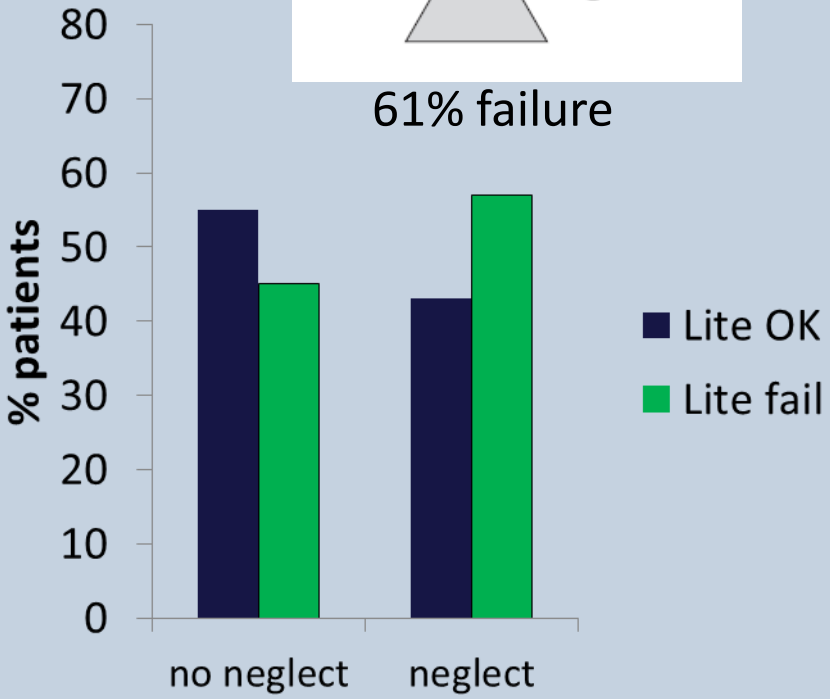


74% failure



61% failure





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Lite – less contaminated & more sensitive

Conclusion:

New neuropsychological screens provide sensitive, clinically applicable tools, with tests revealing of underlying cognitive processes & helpful for rehabilitation

New directions:

International

책
가방

書
背包

Automated

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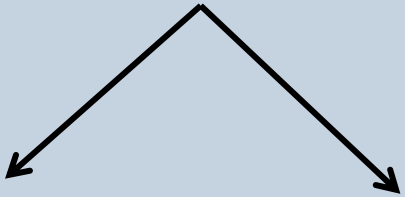
Neuropsychological rehabilitation trials

Carmel Mevorach

- Computer game playing (vs. Tetris) shown to improve attentional functions in healthy young participants (Green & Bavelier, 2003)
- But do the effects of brain training generalise (Owens et al., 2010)?
- Chung et al. (2013) – need for well-designed clinical trial (with appropriate conytrol conditions) to evaluate effects of cognitive training after brain injury

Theories of cognition separate cognitive processes



DOMAIN SPECIFIC
perception
long-term memory
language

DOMAIN GENERAL
executive functions
sustained attention
working memory

In principle, training on domain general processes should produce generalization

In the BCoS trial, 60% of patients had DOMAIN SPECIFC + DOMAIN GENERAL problems

The presence of a DOMAIN GENERAL problem helped account for 18% more of the variance on ADL outcvome at 9 months

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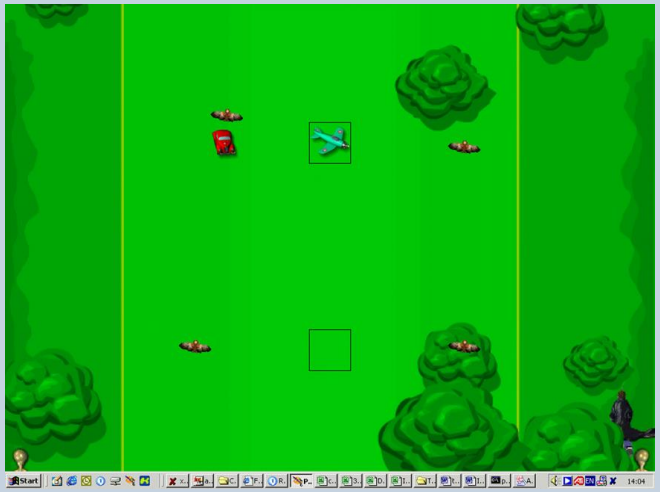
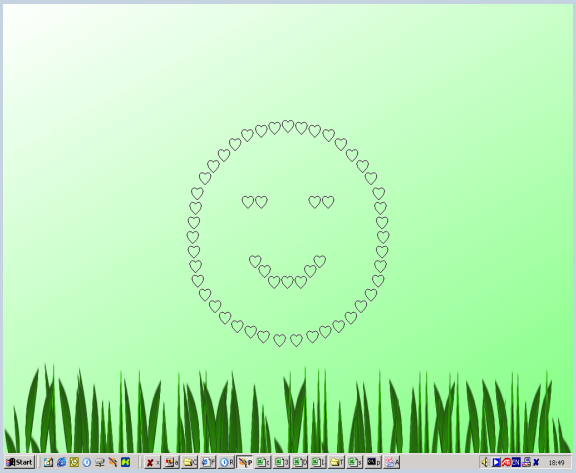
We examined whether training of domain general cognitive processes does improve cognitive outcome after stroke

Patients trained (i) on tests ‘weighting’ sustained attention, working memory and executive functions (dealing with response competition) or (ii) on Tetris





Tests increase in difficulty as patients succeed, there is graphical feedback per session and accumulating feedback over sessions

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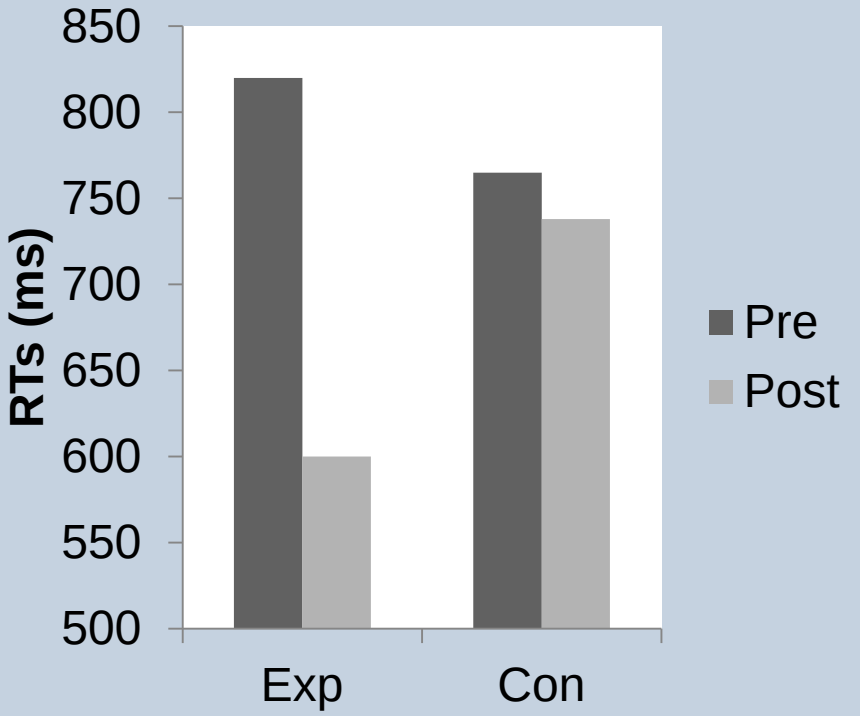
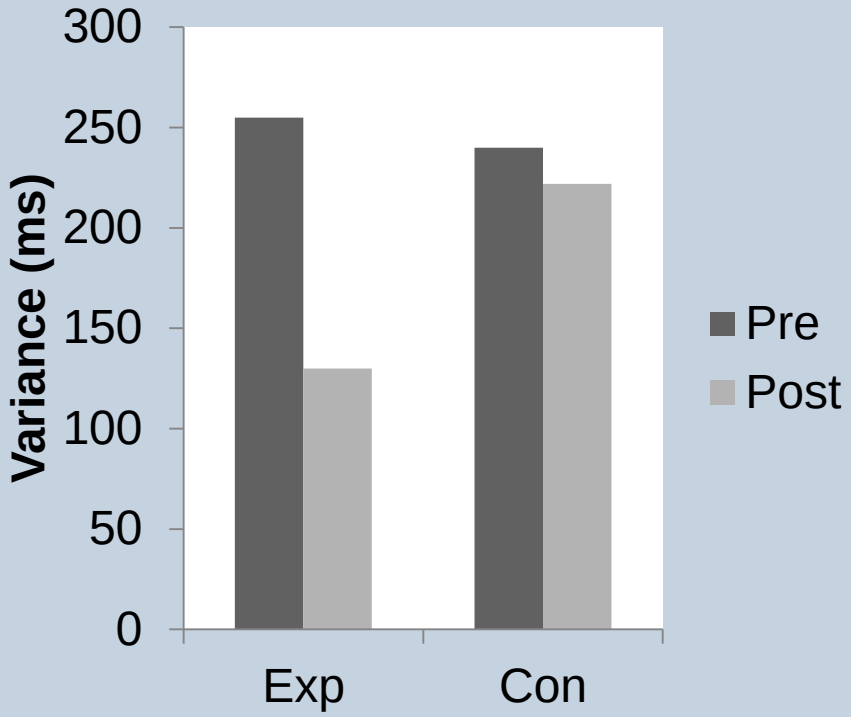
Sustained attention task





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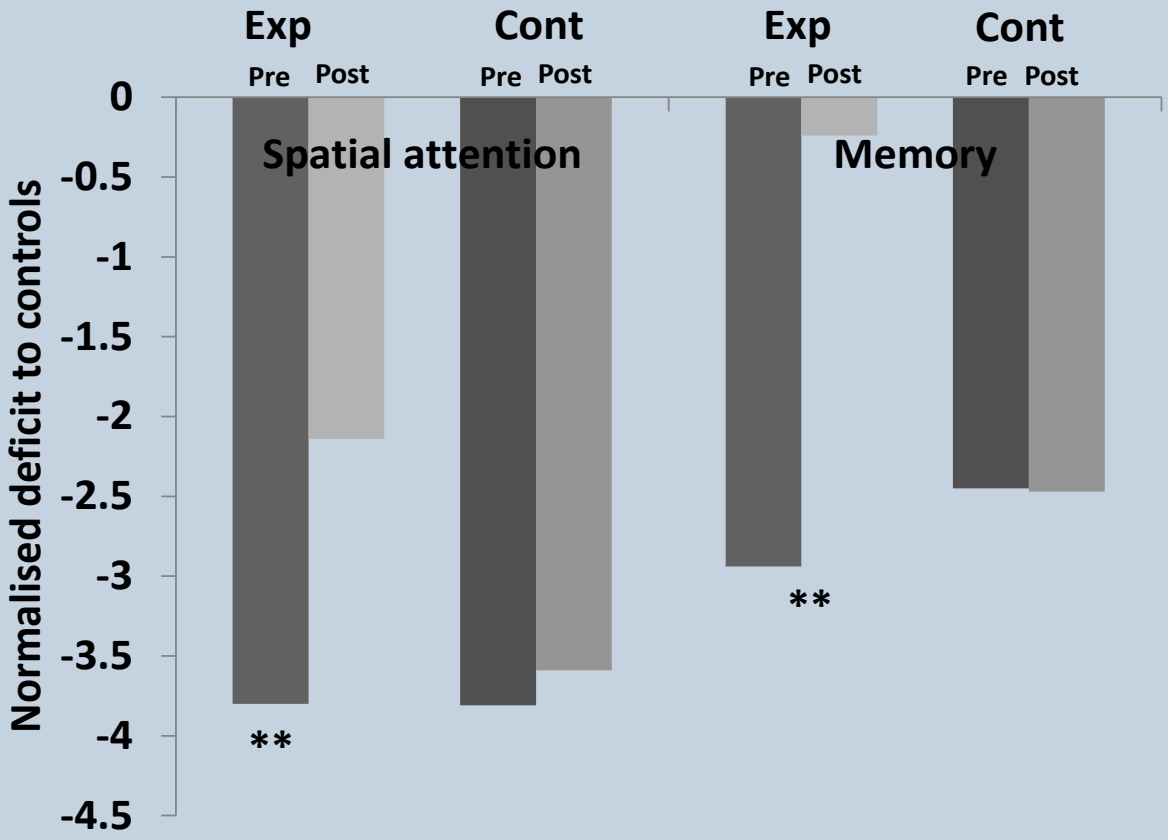
Effects on untrained aspects of BCoS



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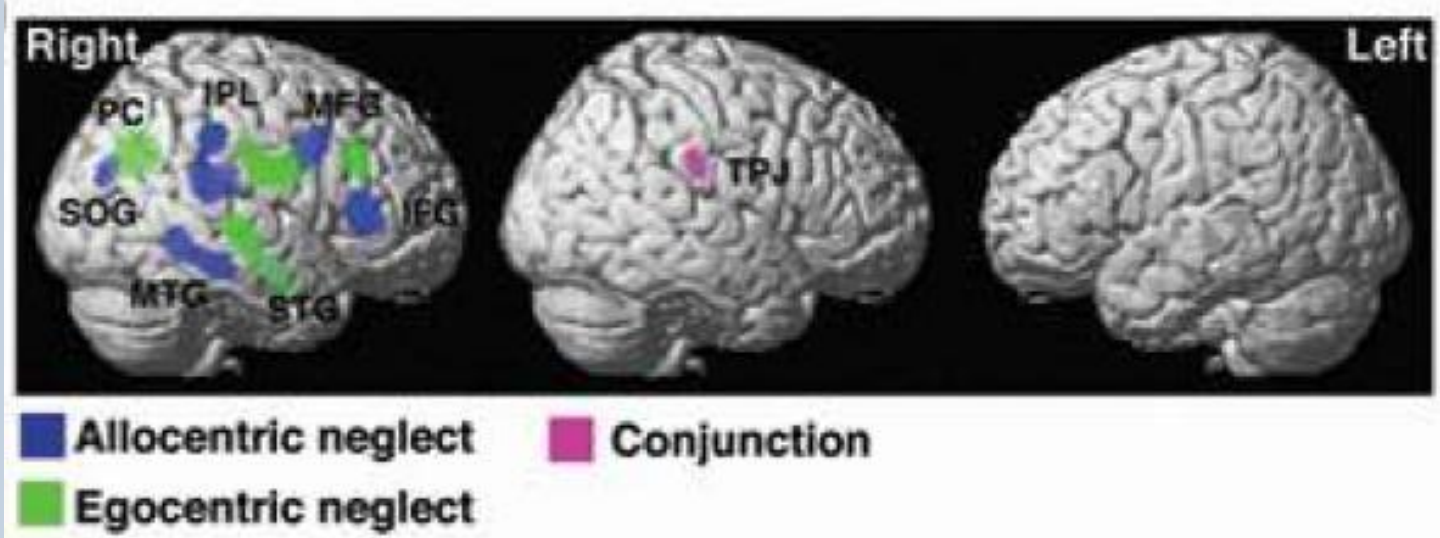
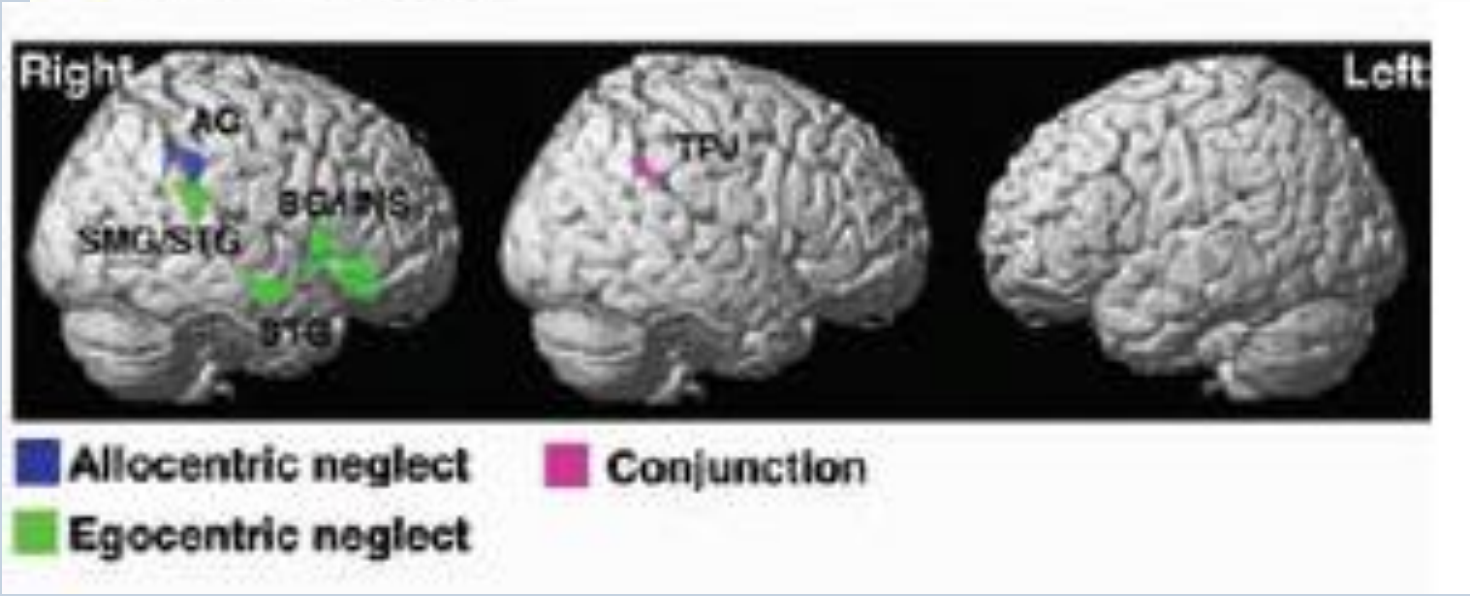
Data hold promise on the effectiveness of domain-general cognitive training



3 months



9 months

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Lesions predictive of
different recovery profiles of neglect

- INDIREA
- 1. Extend ‘stroke-specific approach’ to aspects of attention
  - which aspects to include?
- 2. Extend rehabilitation to contrast different aspects of attention

Thanks for your attention

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