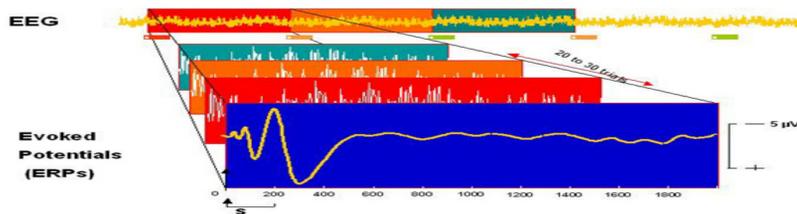


# Mild Cognitive Impairment: Cognitive testing and EEG changes

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## BACKGROUND

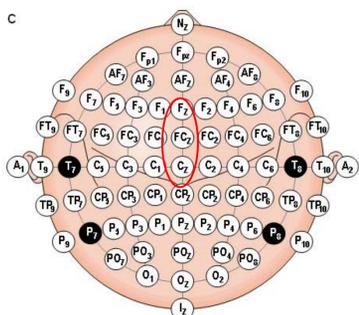
- Speed of information processing and working memory can be affected in Mild Cognitive Impairment (MCI)
- EEG can measure electro-physiological changes in brain function at the order of milli-seconds
- Event Related Potential (ERP) is one standard way of interpreting EEG data
  - N-back tests working memory
  - P2 is a positive wave occurring around 200 msec
- OBJECTIVE: compare cognitive performance and ERP N-back results of MCI and Healthy Controls (HC)



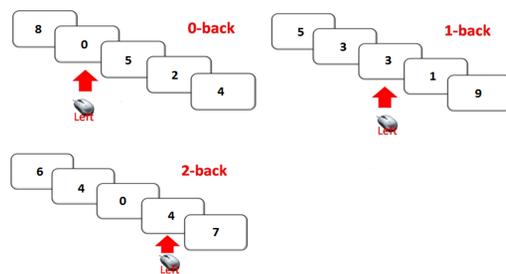
## METHODS

- 13 MCI patients from Bruyère Memory Program (Ottawa)
  - RBANS Memory < 10<sup>th</sup> percentile
  - And up to one other domain < 10<sup>th</sup> percentile
- 9 healthy controls (HC) Ottawa population
- MoCA, RBANS, Trails A & B
- ERP: 0-back, 1-back, 2-back
- Software: NeuroScan NuAmps 4.3; Brain Analyzer 2.0

### EEG leads



### N-back test



## RESULTS

### Participants

	MCI (n=13)	HC (n=9)	p
% Female	53.8	55.5	1.0
Age*	75.6 (6.4)	68.7 (3.5)	0.008
Education	14.8 (2.9)	15.5 (3.0)	0.544

### Standard testing

Test	MCI (n=13)	HC (n=9)	p
MoCA	22.3	27.4	.00
RBANS Total	79.2	113.3	.00
Imm Memory	71.1	107.6	.00
Del Memory	59.2	110.3	.00
Visuosp/const	107.2	124.9	.01
Language	89.8	99.3	.06
Attention	93.5	103.1	.09
Trails A (sec)	57.4	35.9	.04
Trails B (sec)	173.5	76.4	.00

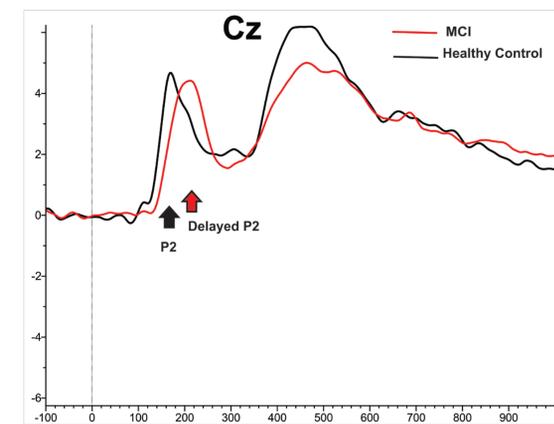
### N-back Behavioural

	ACCURACY (%)			REACTION TIME (msec)		
	MCI (n=13)	HC (n=9)	p	MCI (n=13)	HC (n=9)	p
0-back	97.3 (2.4)	96.8 (2.9)	0.7	480 (69)	424 (43)	0.002
1-back	88.9 (7.6)	95.0 (2.0)	0.02	562 (70)	467 (41)	0.002
2-back	52.9 (14.6)	74.3 (11.5)	0.002	628 (77)	532 (44)	0.002

### N-back ERP P2 latency

Condition	MCI (msec)	HC (msec)	p
0-back	196 (24)	177 (24)	0.04
1-back	196 (21)	175 (21)	0.04
2-back	195 (25)	174 (25)	0.04

### ERP



## DISCUSSION

- This MCI group
  - did more poorly on standardized cognitive testing
  - were slower and made more mistakes in the N-back
  - showed a significant delay in the P2
- Further work will be required to confirm if P2 latency is useful in measuring decreases in speed of processing – and ultimately to help discriminate between MCI and healthy cognitive aging.

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