

# Can brain training lead to short term and sustained improvements in cognitive function?

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<b>Registration date</b> 18/09/2009	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 07/08/2020	<b>Condition category</b> Nervous System Diseases	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

**Plain English summary of protocol**  
Not provided at time of registration

## Contact information

**Type(s)**  
Scientific

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## Additional identifiers

**Protocol serial number**  
Protocol version 9 21/05/09

## Study information

**Scientific Title**

A randomised single-blind three-armed controlled trial comparing evidence-based reasoning brain training (RBT), general brain training (GBT) and a control treatment to determine short term and sustained improvements in cognitive function

## **Acronym**

BrainTrain

## **Study objectives**

Study 1: All adults

Primary hypothesis:

1. In adults of all ages, there will be significant improvements in global cognition measured by a composite cognitive score in people allocated to RBT compared to those allocated to control after 6 weeks and 12 months of brain training.

Secondary hypotheses:

1. There will significant improvements in fluid intelligence and other aspects of cognition including attention, memory and working memory in people allocated to RBT compared to those allocated to the control treatment after 6 weeks or 12 months of training
2. There will no significant improvements in cognitive outcomes in people allocated to GBT compared to those allocated to the control treatment after 6 weeks or 12 months of training
3. There will significant improvements in a broad range of cognitive outcomes and a composite cognitive score and specifically in fluid intelligence and reasoning in people allocated to RBT compared to those allocated to the GBT treatment after 6 weeks or 12 months of training

Study 2: Adults aged greater than 60 years

Primary hypothesis:

1. In people over the age of 60, instrumental activities of daily living (IADL) will be significantly improved in people allocated to RBT compared to those allocated to a control treatment after 12 months of brain training.

Secondary hypotheses:

1. In people with age-associated cognitive decline (AACD), there will be significant improvement in a broad range of cognitive outcomes, a composite cognitive score and IADL in people allocated to RBT compared to those allocated to the control treatment over 12 months of brain training
2. There will significant improvements in attention, memory, working memory, fluid intelligence and a composite cognitive score in people over 60 allocated to RBT compared to those allocated to the control treatment after 6 weeks or 12 months of training
3. There will no significant improvements in cognitive outcomes in people over 60 allocated to GBT compared to those allocated to the control treatment after 6 weeks or 12 months of training
4. There will significant improvements in a broad range of cognitive outcomes and a composite cognitive score in people over 60 allocated to RBT compared to those allocated to the GBT treatment after 6 weeks or 12 months of training

## **Ethics approval required**

Old ethics approval format

## **Ethics approval(s)**

Not provided at time of registration

## **Study design**

Randomised single-blind three-armed controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Treatment

## **Health condition(s) or problem(s) studied**

Dementia prevention

## **Interventions**

1. RBT will focus upon tasks related to reasoning and problem solving. In the Willis et al (2006) study, which provides the best evidence base for sustained benefit, reasoning training was the only brain training that conferred generalised benefits on other aspects of cognition and everyday activities. The recommendation is for participants to complete the training for 10 minutes every day, although with flexibility to do more or less than the recommended amount. An initial feasibility pilot of the brain training package has been completed on 22 older individuals which has been very well received and enabled minor presentational issues to be addressed.
2. GBT will cover a range of cognitive tests other than reasoning/problem solving found in commercial brain training games. Again the recommendation is for participants to complete the training for 10 minutes every day.
3. Control: the control group will perform an internet search based task every day.

## **Intervention Type**

Other

## **Phase**

Not Applicable

## **Primary outcome(s)**

1. Overall performance on cognitive tasks (composite score) at 6 weeks and 12 months in all participants comparing RBT and dummy/placebo treatment
2. Everyday activities at 12 months in participants over 60 comparing RBT and dummy/placebo treatment

## **Key secondary outcome(s)**

1. All participants:  
Cognitive test battery including:
  - 1.1. Memory
  - 1.2. Working memory
  - 1.3. Speed
  - 1.4. Fluid intelligence
  - 1.5. Executive function:
    - 1.5.1. Paired Associate Learning task
    - 1.5.2. Spatial Working Memory
    - 1.5.3. Digit span

1.5.4. Grammatical reasoning

2. Participants over 60 years old:

2.1. Hopkins verbal learning test (HVL - recognition subscale)

2.2. Self-reported assessment of Instrumental Activities of Daily Living (IADL) from the Minimum Data-set Home Care scale

**Completion date**

01/01/2012

## Eligibility

**Key inclusion criteria**

As part of an exciting partnership between the BBC and the Alzheimer's Society, the BBC will invite all adults in the UK and internationally to take part in a randomised controlled trial (RCT) of brain training. It is anticipated that between 75,000 and 100,000 participants will take part. The population will be analysed as two separate studies:

1. All adults, either sex
2. Adults aged greater than 60 years, either sex

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Other

**Sex**

All

**Total final enrolment**

52617

**Key exclusion criteria**

1. Aged less than 20 years
2. Dementia
3. Not living in UK

**Date of first enrolment**

01/01/2010

**Date of final enrolment**

01/01/2012

## Locations

**Countries of recruitment**

United Kingdom

England

**Study participating centre**  
**Wolfson Centre for Age-Related Diseases**  
London  
United Kingdom  
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## Sponsor information

**Organisation**  
King's College London (UK)

**ROR**  
<https://ror.org/0220mzb33>

## Funder(s)

**Funder type**  
Charity

**Funder Name**  
British Broadcasting Corporation (BBC) (UK)

**Funder Name**  
Alzheimer's Society (UK)

**Alternative Name(s)**  
alzheimerssoc

**Funding Body Type**  
Private sector organisation

**Funding Body Subtype**  
Associations and societies (private and public)

**Location**  
United Kingdom

# Results and Publications

## Individual participant data (IPD) sharing plan

### IPD sharing plan summary

Not provided at time of registration

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	01/06/2010	07/08/2020	Yes	No
<a href="#">Results article</a>	results	01/11/2015	07/08/2020	Yes	No