Maintain Your Brain

Henry Brodaty and the MYB Research Team
Maintain Your Brain (MYB) - Aims

1. Develop a new MYB digital platform that delivers multi-modal, personalised and sequential modules that target dementia risk factors via the Internet

2. Evaluate the efficacy of the MYB digital platform to reduce the rate of cognitive decline in non-demented community dwelling persons aged 55 to 77 yrs
Maintain Your Brain (MYB) - Aims

3. Examine the impact on reduction in risk factors, improvement in specific module targets (physical activity, nutrition, depression, individual cognitive domains); and

4. Evaluate the relative cost effectiveness of the platform.
MYB - Hypotheses

Primary hypotheses (intervention vs control)
- less cognitive decline (3 yrs)

Secondary hypotheses
- relationship between intervention fidelity (compliance & adherence) and cognitive outcomes
- less categorical cognitive impairment in the intervention group compared to the control
- dementia risk profile will improve significantly more in the intervention group
- risk profile improvement will correlate with better cognitive outcomes
- less incident all-cause dementia (8 yrs)
MYB - Outcomes

Primary Outcomes
- Decreased cognitive decline over 3 years

Secondary Outcomes
- Decreased incidence of dementia (at 3 years)
- Risk factor score
- Specific cognitive domains
- Physical exercise, weight/obesity
- Diet
- Others

Primary Analysis: ITT
Secondary: Completer
MYB - Sample

Recruit from *45 and Up Study*

- 10% NSW 45yo +, Medicare list, 267,000, ≈2007
- Target = 55-77yo s, > 2 risk factors for dementia
- Internet, computer, consent
- No dementia
Four basic modules

Physical activity

Diet & nutrition

Brain training

Depression
Welcome to the Physical Activity Module

- **Balance Training**: 42%
  - 3 days per week

- **Aerobic Exercise**
  - We recommend you focus on balance and strength training

- **Strength Training**: 30%
  - 2 days/wk at a moderate intensity

Your goal for this week is: **Increase the number of exercises you are doing to 4 upper and 4 lower body exercises that you can perform safely, so that you are achieving 45 minutes of strength training per session.** You can find out more information about Strength Training below.

- **My Physical Activity Goals**
- **My Feedback History**
- **Strength Training Information and Factsheets**
- **Strength Training Video and Exercise Cards**
Welcome to the Nutrition Module

How to piece it together
The Mediterranean pyramid
The Mediterranean cuisine and lifestyle
The Mediterranean pantry and shopping list
Sample menu plan
Meal and snack ideas
Recipe library
Food allergies, intolerances and drug interactions
Scientific literature

My Mediterranean Goals

The Mediterranean Diet

The Ideal Mediterranean Diet
MYB - Interventions

• Year 1, up to 4 modules of 10 weeks each
• Internet coaching
  • Brain training + socialisation
  • Physical activity
  • Nutrition
  • Depression/anxiety treatment
• Information group
  • 10 wks static advice; xpt Brain training module: National Geographic video + Qs
MYB - Boosters

- Coaching group
  - Every month Yr 1-3
- Information group
  - Every quarter Yr 1-3
- No boosters for depression/anxiety module
MYB – Online Evaluation

- Cognition – COGSTATE + Cambridge Brain Science
  - Domains: verbal PALT, visual memory, executive function, speed of information processing, working memory
  - LOGOS: word list learning & delayed recall
- Function – Short-Amsterdam-IADL (informant)
- Short ANU- ADRI baseline and annually
MYB – Compliance

• Self-report
  – Physical activity
  – Diet
  – Weight
  – etc…..

• Monitor activities online
  – Logins, activities accessed, activities complete
  – Help (“tickets” and email)
MYB – Timeline

• Completed Validation
• Completed Pilot study
• Jun-Oct18 – recruitment for main trial
• 7/18-10/19 – 4 quarterly modules + assessments
• 2019-21 – cumulative boosters
• 2019-21 – annual assessments
Invitations N = 96,418

Consent N = 14,064
- Screening N = 12,281
  - Ineligible N = 1,255
  - Completed 0-1 tasks N = 1,172
  - Completed 2-10 tasks N = 3,273
  - Completed all 11 tasks N = 6,257

No Screen N = 1,648 Withdrawn N = 135

Baseline N = 11,026

Withdrawn N = 324

Consent N = 14,064
- Ineligible N = 1,255
- Baseline N = 11,026
  - Completed 0-1 tasks N = 1,172
  - Completed 2-10 tasks N = 3,273
  - Completed all 11 tasks N = 6,257

Randomised N = 6,236
- Eligible for 1 module = 121 (2%)
- Eligible for 2 modules = 1,711 (27%)
- Eligible for 3 modules = 2,814 (45%)
- Eligible for 4 modules = 884 (14%)

Ineligible N = 21
- Eligible for PA = 5,169 (83%)
- Eligible for Diet = 5,487 (88%)
- Eligible for PoM = 1,465 (24%)
- Eligible for BTS = 3,400 (55%)
Randomised (enrolled)  
N = 6,236

**Tranche A**  
N = 5,628 (90%)

- Withdrawn at Time 1 = 23 (<1%)
- Withdrawn at Time 2 = 56 (1%)
- Withdrawn at Time 3 = 93 (1%)
- Withdrawn at Time 4 = 47 (1%)
- Withdrawn at Time 5 = 29 (<1%)
- Withdrawn from PA = 274 (5%)
- Withdrawn from Diet = 292 (5%)
- Withdrawn from PoM = 124 (7%)
- Withdrawn from BTS = 239 (6%)

**Tranche B**  
N = 608 (10%)

- Withdrawn  
N = 230 (4%)

- Active  
N = 576 (9%)

- Withdrawn from PA = 274 (5%)
- Withdrawn from Diet = 292 (5%)
- Withdrawn from PoM = 124 (7%)
- Withdrawn from BTS = 239 (6%)

**Active**  
N = 6,236

- Withdrawn  
N = 5,398 (86%)

- Active  
N = 5,398 (86%)
MYB – Module engagement

Engagement (%)

Time 1  Time 2  Time 3  Time 4  Time 5

- Brain Training
- Peace of Mind
- PA
- Nutrition
MYB – Challenges

- Building IT platform
- Clinicians and IT communication
- Engagement & adherence to training programs
- Maintaining participant enthusiasm
- Engaging informants of participants
- Completion of quarterly and annual assessments in year 1
- Navigation of the MYB site and modules
- IT issues
MYB – IT Challenges

• Outdated computers no longer supported by browsers and third parties (eg, Chrome, CBS)
• Computer settings incompatible with third party applications (eg, COGSTATE requires screen resolution to be at least 1024x768)
• Third party applications can only be used with certain internet browsers (eg, CBS has ‘freezing’ issue with Internet Explorer)
• Brain Training exercises require Flash to be activated
• Provider changes platform eg Flash → Unity
• IT challenges with LOGOS (eg, difficulties understanding accents, call back issues) - resolved
MYB – Annual Assessment

Yr 1 Annual Assessment completion as percentage of total randomised (n=6,236).

<table>
<thead>
<tr>
<th></th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrawn</td>
<td>4</td>
</tr>
<tr>
<td>0 completed</td>
<td>31</td>
</tr>
<tr>
<td>Completed 1-5 assessments</td>
<td>3</td>
</tr>
<tr>
<td>Completed 6-8 assessments</td>
<td>6</td>
</tr>
<tr>
<td>Completed all 9 assessments</td>
<td>56</td>
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</tbody>
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62%
MYB – Outcomes

A positive (successful) trial outcome will be based on the primary outcome

1. Better cognition from baseline to three years

Success = scalability nationally and globally
Internet-based therapies: advantages

– Home-based
– Geographically isolated individuals
– Scalable
– Relatively cheap (but not free)

Current trials:
– Richard E et al, Lancet Digital Health, 2019; 1(8), Pe424-e434
– MYB (Heffernan M et al, Journal of Alzheimer's Disease, 2019;70(s1): S221-S237)
Disadvantages

– Requires IT Platform development ++
– Requires Central HQ to run and monitor
– Not everyone has computer or internet access or is tech-savvy
– Not yet proven to work
Acknowledgements

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