



RESEARCH

INFORMATION

## Development and pilot feasibility trial of ApplTree – a personalised memory aid app for use in brain injury rehabilitation.



### AIMS

- To refine and build the evidence base for the features of ApplTree – an app designed by our team to support memory in people with acquired brain injury (ABI - an injury to the brain since birth). People with ABI commonly experience difficulties with memory, concentration, attention and judgement that can limit the ability to live independently.
- To learn how to feasibly run a trial comparing ApplTree with Google Calendar (a commercially available reminding app).
- To understand the feasibility of introducing a memory aid app to support memory in a community brain injury rehabilitation setting.



### KEY FINDINGS

- A step-by-step information entry method (where one piece of information is entered on each screen) was preferable to a scrolling interface (with lots of information on each screen) - scrolling is used by currently available commercial apps recommended in brain injury rehabilitation. People with acquired brain injury entered reminders more accurately when using the step-by-step user interface than when using the scrolling interface.
- Formal qualitative analysis of the feedback from study participants suggests that the features developed for ApplTree make it more usable and useful to people receiving brain injury rehabilitation than apps without those features.
- Results indicate the intervention is feasible to use in community neuropsychological rehabilitation settings.
- Recruitment rate to the pilot trial was 58% of the target, 65.5% of those randomised completed the study and adherence to the intervention (use of the app until the end of the study) was 57.9%. These results can inform the development of a larger trial that could find out which app is the best to use.



WHAT DID THE STUDY INVOLVE?

- In an experiment, 32 people with ABI set reminders using two app designs; step-by-step and scrolling.
- The app design found to be most suitable (AppTree) was then used in a randomised controlled trial in which 39 people with ABI were enrolled.
- This trial compared AppTree to Google Calendar - a commercially available reminding app. It was a pilot feasibility trial.
- We wanted to find out how many people would take part, stay in the study and use the apps, to understand if it would be possible to carry out a full scale randomised controlled trial.
- We also wanted to understand how feasible it would be to give people a memory app intervention in community brain injury rehabilitation services.

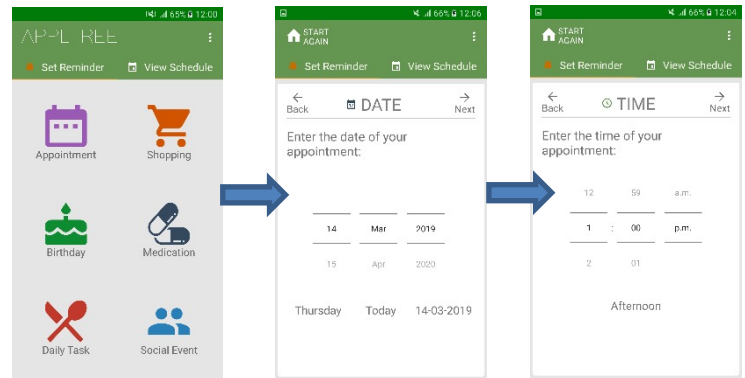


WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?

Participants made fewer errors when setting reminders with the **step-by-step app design**; many screens with just one piece of information on each screen.

Quote from a participant:

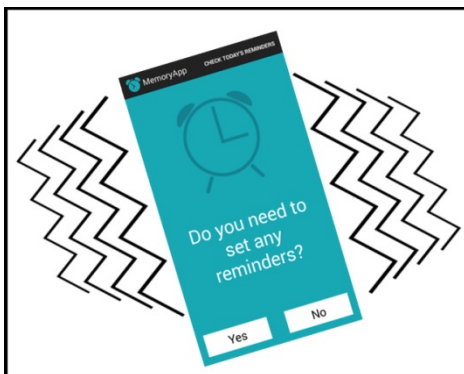
*“...it (step by step design) was... easier doing it one bit at a time instead of all at once.”*



In the trial other AppTree features improved usefulness, especially **‘unsolicited prompts’**, which ask users four times a day if they need to set a reminder.

Quote from a participant who received these prompts:

*“I quite often forget to set reminders! They (the prompts) make me kind of stop and think, ‘oh no but wait a minute, there’s things I should be doing today right now...”*



- 285 people were considered for the trial from four brain injury services. 63 were eligible and approached. 39 consented to take part. 29 completed the baseline phase and 19 completed the follow up phase.
- A full randomised controlled trial comparing AppTree to Google Calendar would need to analyse data from 54 people. This would require 833 service users to be considered for participation by service staff resulting in 181 eligible participants being referred to the study. This would need a multi-centre study.
- A single hour long in-person or remote session involving a 30 minute video tutorial and 30 minutes of support from a rehabilitation worker was sufficient for 90% of the participants to learn how to use a reminding app; 79% were still using it two months later.



## WHAT IMPACT COULD THE FINDINGS HAVE?

- People with ABI
  - Features that helped people remember to set more accurate reminders could be implemented in other reminding apps to improve their effectiveness.
  - Findings inform the development of a large-scale clinical trial (the highest quality experiment) to see if ApplTree can really improve memory outcomes compared to commonly recommended apps.
  - If successful, ApplTree (or an app with the same features) could be rolled out to people experiencing memory difficulties receiving community rehabilitation.
- Policy
  - The findings are a step towards evidenced based practice for reminding app intervention which could influence rehabilitation policy and clinical guidelines.
  - During the Covid-19 pandemic the trial was run remotely and this was feasible – future trials could also be remote, making them more efficient to run.
- Practice
  - The intervention session to train use of ApplTree and Google Calendar was successful (patients learned to use the app and kept using it) and feasible (the session was short and could be completed remotely)



## HOW WILL THE OUTCOMES BE DISSEMINATED?

- Publications in scientific journals and at academic conferences
- Outcomes will be publicly available online and disseminated to ABI charities such as Headway.



## CONCLUSION

- The features developed in the ApplTree app can improve user experience for people with memory difficulties after ABI.
- The short app intervention given to participants in this trial is feasible to implement in practice.
- A large-scale clinical trial is needed and we now know 54 participants would need to complete this trial to conclusively answer if ApplTree improves memory compared to Google Calendar.



## RESEARCH TEAM & CONTACT

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### Additional Information

CSO translational Clinical Studies Research Committee 2018 (£295,356) awarded to Professor Jonathan Evans.