App could help older adults with memory loss

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Nikki Hill and John Hannan discuss their My Day app, which is designed to be a way for adults over 60 to remember and keep track of important tasks. Credit: Tom Klimek

From time to time, forgetting to pay a bill, misplacing car keys or searching for reading glasses (while you're wearing them) can be an irritating, yet normal, part of life. But for people over the age of 60, memory loss that encroaches into daily living—like habitually forgetting to take medications or missing appointments, for example—might have

more serious consequences.

Nikki Hill, a postdoctoral fellow in Penn State's College of Nursing who works with older adults, wants to improve the lives of people living with memory loss and is developing an app that might offer a solution.

For the 2 million people over the age of 65 living in Pennsylvania (the fourth highest percentage of older adults in the nation), this could be a real brain boost.

The iOS app My Day, which will soon undergo preliminary usability testing for a clinical trial, is designed to be a way for adults over 60 to remember and keep track of important tasks. Its calendar, to-do list and journal features are designed to be easy to use for those with memory loss who, from day to day, might also have trouble remembering how to use the app itself.

"Even some level of memory loss or cognitive impairment—I'm not talking about dementia at this point—can have a big impact on a person's life," Hill said. "Changes in memory can impact the way an individual is able to complete important tasks and how independent he or she can be. On an emotional and psychological level, people begin to perceive and internalize these symptoms, which can cause fear, anxiety and even depression."

As part of the study, Hill will work with each participant to create a personalized plan for how to use the app based on a goal he or she would like to accomplish—many participants need help with health management, while others have more social needs. Whatever the goal, Hill's hope is that the app will help them maintain their independence and quality of life.

Each day, participants have access to a new to-do list, calendar page and

journal entry, which displays information about what they need to do that day. They can review the calendar, get alerts about upcoming doctors appointments, or check off to-do items for taking medication or paying bills.

For some participants, being able to remember the names of individuals in their social groups is challenging. So, to alleviate anxiety before going out with friends, they can use the app's journal feature to review information they've previously added about their friends, including names and notes coupled with photographs.

●●●●○ Verizon 📶   1:12 PM   90% 🔋

Today is Friday, Apr 3

🗓️ Calendar for Saturday, Apr 4

7:00 AM: Take Medication
Lisinopril (blood pressure, take with glass of water)   ✓

8:00 AM: Take Medication
Metformin (blood sugar, take with breakfast)   ☐

12:00 PM: Appointment
Meet Pat for lunch at Corner Room   ☐

Tap to Add New Item

◀ Previous Day | Add Calendar Event | Next Day ▶

🗓️ **Calendar** | ✓ **To Do** | 📔 **Journal**

Credit: Penn State

Though paper-based agenda programs have proven useful in the past, Hill wanted to use technology because of the interactive capabilities it can offer.

In addition to digital photos, the app can send audible alerts and notifications—something a traditional paper-based planner can't. Someday soon, Hill would also like to make it possible for a participant's spouse, child or caregiver to share access to the app, if needed, to check in on completed to-do items and add appointments to the calendar.

"We know older adults who have memory loss symptoms are at a greater risk for developing dementia later on," Hill said. "So giving people an easy way to feel more in control of their symptoms and helping them maximize their functional abilities now might have long-term implications on their cognitive health."

John Hannan, an associate professor of computer science and engineering in the College of Engineering, helped turn Hill's vision into a reality.

Since My Day isn't the average calendar or to-do list app available for download at the iTunes App Store, Hannan has designed and developed it specifically for people who are not only experiencing issues with memory, but who also have varying degrees of technological savviness to begin with.

"Some individuals in the study have their own iPads, while others have never even held one or used an app," said Hannan, who has also helped build such Penn State apps as Dining@PSU and the Engineering Penn

State Newsstand app. "Again and again, we asked ourselves how do we design this so it's going to be accessible to this population?"

Hill and Hannan had to carefully choose each font, color and page layout to make the app easy to read and navigate.

●●●●○ Verizon 📶   1:19 PM   89% 🔋

Today is Friday, Apr 3

📓 Journal for Friday, Apr 3

Betty's grandson…

📷 Add Photo Entry   ⌨ Add Text Entry

◀ Previous Day   **Edit**   Next Day ▶

📅 Calendar   ✅ To Do   📓 **Journal**

"What seems normal to the tech-savvy could potentially cause a big problem for someone who hasn't used this type of technology before," said Hill.

For these reasons, there's limited scrolling, fonts are large, and each screen is color-coded and free of visual clutter. Actions like swipes and pulls that are intuitive for daily tech users, aren't so obvious for many older adults. And if a participant is idle on a screen for too long without doing anything, on-screen prompts can guide them through what they should do next (like choose a date or pick a time).

So far, it's been a rewarding experience for Hannan, who admires the strides apps have been making to address the needs of a diverse mix of people, including the visually impaired.

"It's nice to develop an app that can potentially have a real impact on bettering people's lives," he said. "And this particular project is also a great learning experience that I am able to extend to my students."

In this first round of testing (which is planned for the next couple of months and funded by the National Hartford Center of Gerontological Nursing Excellence), Hill will collect data about how easy the app is for people to use and if it helps them meet their goals. If all goes well, she'll pursue a pilot and clinical trial in the years to come.

As a gerontological nurse and researcher, it might seem unusual that Hill has turned to app development, but for her, it's just a new way of helping people.

"John and I see the possibilities for using technology more and more to improve the lives of older adults," she said. " We're always asking ourselves how we can integrate tech into their lives in a way that is meaningful and that really addresses a need they have."

Provided by Pennsylvania State University