



## Baycrest Centre for Geriatric Care

### Patients with Severe Memory Loss Given Brighter Future with palmOne Handhelds

Since 1918, Baycrest Centre for Geriatric Care has been devoted to enriching the quality of life of the elderly. An internationally renowned academic health sciences center affiliated with the University of Toronto, Baycrest is advancing care in the 21st century through the power of research and education – with a focus on brain functioning and mental health.

Memory-Link is a unique outpatient service at Baycrest established to assess, train, and support adults with severe memory problems. palmOne Canada has recently joined Baycrest's groundbreaking amnesia rehabilitation efforts to apply emerging handheld technology to the program's unique multidisciplinary approach involving psychology, social work, occupational therapy, research, and volunteers.

#### The Challenge

Twelve years ago, Neuropsychologist Dr. Brian Richards began to see clients suffering from very specific forms of memory-loss related to neurological events such as strokes, tumors or infections, and became aware of a significant gap in the medical system: If you suffer from permanent memory loss, yet experience no other disability or signs of a deteriorating condition (as found with Alzheimer's or Parkinson's patients), there are very few services available and you are, for the most part, on your own.

However, exciting memory research has demonstrated that there are preserved memory systems in the brain capable of accumulating new information, and that these systems can be tapped into to teach amnesic individuals new skills. This discovery provides an avenue for rehabilitation that can enable severe memory impaired individuals to compensate for their memory impairment.

Dr. Richards began developing training methods to tap into the preserved systems of these severely memory impaired clients and demonstrated that his clients could be trained to use external memory aids for the storage and retrieval of personally important information. With this, Dr. Richards launched the Memory-Link program, a world-first.

"The Memory-Link project was created to give back some degree of independence to clients with severe memory impairment," explains Dr. Richards. "Memory-Link taps into these preserved memory systems to teach amnestics the skill sets necessary to utilize compensatory memory-aids, such as palmOne handhelds."

The Memory-Link project originally provided clients with a paper-based external memory-aid called the "Baycrest planner", combined with a multi-alarm system. The planner was divided into four sections: calendar, phone numbers, things to do and memos, and the alarm was programmed to ring at target times during the day – prompting the user to engage in daily appointments and tasks.

With the arrival of electronic planners a few years later, Dr. Richards realized that PDA technology held the promise of playing an advanced role with his Memory-Link clients. Dr. Richards initially looked at various handheld organizers and multi-function watches, but decided against them as they were not very user-friendly. "These earlier models had too many functions, and a lot of hidden steps that would be too difficult for our clients to master," recalls Dr. Richards.

Dr. Richards was impressed with the palmOne organizer and noted that its four major applications served the four essential functions that were designed into the Baycrest planner: calendar, phone numbers, things to do and memos. "We lined up the Baycrest planner next to a palmOne handheld and realized the key features were exactly the same," explains Dr. Richards. "This encouraged us that the shift to advanced palmOne technology was possible."

#### The Solution

Working with earlier models of palmOne handhelds, the amnesic clients adapted to using the device with relative ease. Although the standard palmOne applications served the amnesic clients well, Dr. Richards saw the need to develop additional applications designed to support the unique needs of his clients that went beyond everyday forgetfulness. Baycrest turned to the University of Toronto's Computer Science program to create the custom applications.

Michael Wu, a PhD student at U of T specializing in Human Computer Interaction, developed one such application as part of his master's thesis. Once a week, he met with Dr. Richards and a

"If a client finds his or herself in an unfamiliar situation, they can quickly tap the orientation icon and it will display all information necessary, such as a photo of the location, why they are in this location, what they are doing, who they are meeting with and for how long," explains Dr. Richards. "The orientation tool, along with the standard features of palmOne handhelds, have played a significant role in providing greater autonomy and confidence for -adults with severe memory-loss."

#### Benefits

- ▶ palmOne handhelds are a life-changing tool for adults with severe memory-loss; the device acts as a prosthetic memory for those with amnesia.
- ▶ Patients are more independent and confident in their everyday lives as the handheld reminds them of where they need to be and what they have to do.
- ▶ Clients feel more secure as they are not worried about getting lost; the handheld can take photos of locations to help direct them to where they need to be.
- ▶ Family members feel more at ease knowing their loved one can function with more autonomy than before.

#### Contact Information

- ▶ Baycrest  
[www.baycrest.org](http://www.baycrest.org)
- ▶ palmOne  
[www.palmOne.com](http://www.palmOne.com)

group of his clients to identify key needs. "It quickly became apparent that having an orientation function on the handheld was essential since memory-impaired patients can become easily disoriented in a new surrounding", says Wu.

Wu completed the custom application in approximately four months and today all 30 clients in the Memory-Link program are using Zire 72 handhelds donated to the program by palmOne. The new orientation tool includes a pull-down menu with four functions: who-what-where-why, thus enabling users to easily and quickly input information. The menu also lists key activities -- such as meetings, and tasks such as, shopping, and doctor's appointments -- to make inputting these daily life tasks as effortless as possible.

For example, a client recently had an appointment with her physician. When she arrived at the doctor's office, she was told he was running 45 minutes late. In the past, she had to wait in the office for the entire time because if she left, she would not remember why she was in that particular part of town or what she was supposed to do next. Using the orienting tool she can now set an alarm to ring in 45 minutes and enter information regarding the location and purpose of her appointment that will serve to re-orient her at the target time. She then simply clicks on the 'done' button and the information is stored. In the meantime, she can go shopping, have a coffee or do errands. When her appointment is due, a pop-up screen will appear on her palmOne, informing her to go back to the doctor's office.

Another client relies heavily on the standard camera function of the Zire 72. When setting up a meeting place, he will take a photo of the location with his handheld so that if he gets lost, he can show it to passersby to obtain directions to the location. This feature was very useful when he was once lost in a European train station -- he simply double checked the photo of the correct platform that he had previously taken and by doing this was able to find the location with ease.

The program is so successful that Dr. Richards is working toward making it available to healthcare institutions across Canada. In 2005, Memory-Link will enroll up to 30 new clients, including young adults who suffer from severe memory-loss, and palmOne will continue to partner with Baycrest to further advance this innovative program. Plans are also underway to incorporate video capture and voice memo recording, and to develop individually customized applications for specific clients.

"PDA technology holds tremendous potential to significantly enhance the lives of those with severe memory-loss," explains Dr. Richards. "We look forward to continue working with palmOne to develop new applications and give individuals with severe amnesia a brighter future."