Presentation: Tactile navigation belt

J.S. ZELEK. ***Tactile personal navigation belt.*** *Gerontechnology 2012;11(2):351;* doi:10.4017/gt.2012.11.02.195.00 **Purpose** The tactile belt is an affordable wearable personal navigation device that allows you to navigate by touch only. The device does not require you to use your eyes, as there is no display, all information is conveyed via touch. It can be described as feeling Mapquest or Google Maps. The device nudges you towards a destination using intermediate way-points and lets you feel how much further you have to go. A Google maps application on a cell phone is used to determine a path to the destination; these waypoints define the path that are sent to the tactile belt; the tactile belt works its way through the queue of waypoints, guiding the person by providing tactile sensations in the direction of the final destination via the way-points. During the travel, a remote caretaker can monitor the user and redefine the path if need be. The device is useful for people with visual (e.g., blind) or cognitive (e.g., Alzheimer's) impairments or for people who are perceptually or cognitively overloaded (e.g., military, first responders)[1-2]. **Method** Two studies were conducted that evaluated the usefulness of the device for people that were older and for people with at different stages of Alzheimer's. The studies were conducted at Toronto Rehab Institute. In both studies, the individuals were guided through a maze with only verbal instructions as a benchmark. The individuals were subsequently guided through the same maze without any priori route knowledge but with belt assistance. In the first study, older individuals were also compared to younger persons. **Results & Discussion** The results of the first experiment confirm that older persons generate more waypoint errors than younger persons. The belt assistance was found to be an efficient means of providing route information for both groups as witnessed by the lack of directional errors made by the participants. The advantage provided by the belt was maintained as the complexity of the routes increased. No errors were made when the belt was the sole source of navigation while some errors were made when verbal navigation commands were issued. In the second study, the applicability of the way-finding signals to persons with dementia was assessed. To do so, participants walked a series of corridors of Sunnybrook hospital while wearing the belt. The results suggest the way-finding belt has potential as a navigation aid for individuals with dementia. The individuals with dementia displayed a few deficiencies in attending to the directional signals that lead to way-finding errors in which the signal was ignored and the intended turn was not made. These errors only occurred in people with strong development of Alzheimer's. It is recommended that the device be used for people with mild Alzheimer's. In a subsequent efficacy evaluation done in conjunction with Baycrest hospital, it was concluded that the device is more useful for people who are still living at home rather than residents of long-term care facilities. Many countries feel the effects of medical care costs of the growing elderly population. Delaying the transfer to long-care facilities can help defer and minimize some of these costs.

References

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Figure 1: Tactile navigation belt consisting of a controller and 4 vibrotactile actuators