New Assistive Technology for Elderly Care

Recent developments in new technology have made great strides in contributing to the care of older persons institutionally and at home. Care services provided within the community (versus those in institutions) are generally less costly and the preferred option for patients with support from family. Although these innovations are based on complex algorithms and advanced technology, the end user experience is simplified enough to benefit patients and provide additional support to caregivers.

In this article, we will explore some of the technologies designed to help the aging population live longer independently. Others may proactively be used to help caregivers perform their responsibilities more effectively.

- **Tracking movements with GPS:** This technology is effective for tracking the elderly who are prone to wandering or suffering from dementia. If equipped with a GPS watch, should this person go beyond a pre-determined “safe zone”, a designated contact can be alerted on their smartphone’s immediately. Additional accessories related to tracking also include the possibly to install GPS trackers in shoes while the service is widely available on most current phones.

- **Mobile Help:** Mobile phones with big readable buttons and other easy to use features with an emergency button on the back that dials a preprogrammed number providing seniors a sense of safety in the event of urgency. An icon on the home screen called “ICE” (in case of emergency) stores pertinent medical details like name, birth date, height, weight, insurance info, important contacts, your physician’s number, any listed conditions, allergies, medications, vaccinations, etc.

- **Community Alarms / Telecare:** Alarms that are activated by pressing a button on the unit, watch or pendant and immediately rings the community alarm or any preset emergency number.

- **Health Monitoring Devices:** These recently developed tools allow caregivers and doctors to keep track of an elderly person’s health with easy to use devices. For example, the Mymedic Telehealth Monitor is compatible with a range of medical devices including weighing scales, blood pressure monitors, blood glucose monitors and peak flow meters connected via wired or wireless (Bluetooth) technology. By taking information from these devices, the monitor can send this data to a nearby clinic. Should any abnormal measurements come in, physicians will be aware, right away.

*Rochester Wellness will be testing the Scanadu Scout and trial the product following its tentative release (late March 2014)*
- **Robotics:** Although there is no substitute for human contact, robots are being designed specifically so that the aging population can interact with them as though they were another person or a pet. The monkey-like robot, Chapit, made by Raytron robotics in Japan, allows you to speak to the robot, have it interpret the information and generate/compute an appropriate response. Although the conversation aspects are interesting it can, more importantly help with practical tasks. Via voice commands, it can turn TV’s/lights on & off, change TV channels and help browse the internet.

Another robot, RIBA, can be used to lift a senior citizen off and onto beds, wheelchairs and toilets. The robot can be controlled by a caregiver or individual themselves.

Robovie II is designed to help elderly and disabled people shop in supermarkets. It can remind users of items on their shopping lists in the store and carry the groceries for them. It can even make suggestions as to which product would go well with those in the shopping cart or previously purchased.

The RAPUDA arm (robotic arm for people with upper-limb disabilities) can be attached to a wheelchair and operated with a joystick. It can be used to pick up different objects.

Some robotic equipments for the elderly and disabled can actually be worn; such as the Hybrid Assisted Limb or HAL. When the wearer wants to move a body part, their brain sends electrical impulses to that particular body part. This affects the surface of the skin which the system is able to pick up on. To help them move the limb, a power level of help (appropriate to the user) is then provided. This device can increase its wearer’s strength by a multiple of up to 10. It has enabled people who haven’t stood up in years to get up and walk.

- **Bed Exit Solution:** This motion-based safety solution by EarlySense enable a caregiver to tailor a specific bed exit sensitivity level based on a fall risk assessment. Immediate alerts based on a patient’s status can be transmitted to handheld devices and remote displays in an effort to bring actionable information to caregivers.
• **Care@Home (Essence) & Beclose devices:** This solution consists of a control panel, a set of wireless easy-to-install devices and mobile/web apps for access. It is backed by a unique smart algorithm, an analytics engine and cloud technology. The system continuously learns a person’s everyday routine, creates a personal pattern and detects any deviations (such as skipped meals, reduced activity or unusual events). The system automatically sends alerts based on severity level to the health care provider and family members via intuitive apps; allowing them to react immediately. Safety events like fire and water leakage are monitored as well.

Some devices such as GrandCare also incorporate socialization, entertainment and communication elements. Family and patients can exchange pictures, messages, e-mails, reminders, calendar appointments, voice messages, family videos, music and more.

Independa is another software company that provides supportive independence products and services to older adults and their caregivers who are typically remote some or all of the time.

• **Fall Detectors:** Contain an accelerometer and tiltmeter to detect falls and send out an alarm to the care provider or community service responsible for care.

• **Tab Safe:** A medication management system that reminds, dispenses, alerts and posts information on complains, inventory and other health information that is accessible from any internet capable device.

• **Smart Homes:** Incorporate numerous sensors which are linked to an intelligent network which ensures safety of the occupants and also can control lighting, heating and ventilation.

• **Other:** Devices include video monitoring and movement detectors which are connected by the internet and WIFI signals. Can be monitored by the family; online from anywhere.

Although assistive technology can play a vital role in contributing to the safety, security, independence and quality of life for elderly people living at home; there are limitations. Elderly people who have visual, auditory, speech, physical and/or cognitive disabilities may not be able to use some of the technology. Furthermore, as these products and this industry is still in its infancy, many of the products are particularly expensive. It is important to assess every individual’s situation and needs while taking into consideration the loss of privacy associated with its use.