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IN DEPTH: TECH NOW

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Caregivers use robot to interact with patients from afar

Al Massey
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For well over 50 years, science-fiction writers have led the world to believe that, somewhere in the far distant future, technology will transform the medical profession.

Perhaps that time has arrived.

In an effort to extend the reach of health care to its long-term care community, Silverado Senior Living Inc., has recently introduced the "Companion" mobile robot to residents of the company's Cypresswood facility in Houston.

Silverado, a long-term care facility specializing in Alzheimer's/dementia, uses the robot to 'virtually' consult with caregivers, residents and family members at the point of care.

"An expert can see, move, talk and hear in another location as though he were actually there," says Silverado's Jackie Barnes, Cypresswood administrator. "As a result, the robot brings a new dimension to patient care."

Because people with advanced Alzheimer's have lost the function of about a third of their brain, significantly reducing their ability to deal with new things, the robot was met with some skepticism by Barnes.

"To our surprise, rather than being intimidated, our residents treat the Companion as though it were simply another person in the room," she says. "We are having a very positive response from both residents and family members."

Medical miracle

Described as "R2D2 with the personality of C3PO" by Barnes, the Companion contains a video camera, microphone and LCD screen fixed to a motorized platform and is connected over a wireless broadband Internet connection to a remote "Care Station."

"The care station is equipped with a joystick and flat screen monitor and has a camera attached as well," explains Mark Mostow, vice president of Silverado Senior Living Inc. "This gives the caregiver the ability to drive it down the hall and interact with patients in real time."

Tim Wright, vice president of marketing for Goleta, Calif.-based InTouch Health Inc., developers of the Companion, says that robots offer one solution that takes advantage of high technology and the Internet to reduce costs and improve efficiency and effectiveness of health care delivery.

Wright stresses that, "the Companion is not designed to replace a caregiver but rather to give remote presence expertise.

"Our focus has been on long-term care largely because, by definition, there is not a lot of medical expertise in a long-term facility," he says. "The robot makes a wide range of medical specialists available to a long-term care facility."

Cost-effective communication

Health care professionals are acutely aware that the ranks of those over the age of 85 will swell by some 38 percent over the next 10 years, placing ever more stress on the health care industry's ability to cope. Compounding the problem, the numbers of those requiring health care support will double.

With the increase in life expectancy, there is a corresponding increase in the costs of caring for the elderly. As this trend develops it will profoundly influence the course of technology and give rise to even more concerns for the elderly.

Through the adaptive use of technology, medical professionals will be able to give absolutely reliable diagnosis and provide virtually instantaneous non-invasive treatment involving no pain and minimal recuperation time, resulting in a healthier and longer-lived population.

There are two classes of robots in use today. Autonomous, those capable of performing useful tasks in a real environment, with natural, unobtrusive human instruction and feedback and teleoperated robots, controlled remotely by an operator in a command and control facility.

The academic world and society's imagination has been largely focused on autonomous robots and how they might be of use in various work settings.

Robot interaction

According to Wright, the Companion robot can best be described as a "teleoperated robot that is evolving into an autonomous one."

Gliding about on a trio of hidden urethane balls, the 5-foot-2-inch tall, 215-pound Companion is connected to a human counterpart through a broadband and wireless network.

Utilizing a joystick, monitor and keyboard, the remote caregiver can see and hear the patient and make a diagnosis or recommendation from virtually anywhere.

"We use it to interact with residents regarding a wide range of needs, Mostow says. "Our vice president of clinical services in California, for example, can use the Companion to walk with

a resident down a corridor in order to see their gait and assess any mobility issues the resident might have. "

This ability to interact in real time is a large reason for its acceptability by residents. The patient can both see and hear who is behind it all. Because this is all being done in real time, the patients interact with the robot as though everyone were in the same room.

"The robot provides caregivers a unique opportunity to view Alzheimer patients," who tend to have outbursts, "in a natural setting, rather than an exam room," Barnes adds.

In addition to long-term care facilities, the Companion is making inroads into the acute care arena, where it is being put to the test to explore the use of remote presence technology to address the national nursing shortage.

Into the future

The robots, some say, might change the dynamics of doctor-patient interaction by allowing patients to spend more time talking and interacting during a virtual visit because there is less interrupting by the other side.

In a survey conducted by Johns Hopkins Hospital in Baltimore, where the Companion is undergoing tests, patients indicate they were more satisfied with the care they received if the robot was used.

Costing around \$2,500 per month, medical robots such as the Companion are helping solve the enormous problems caused by convergence of a rapidly aging population, a shortage of health-care professionals and rapidly increasing health budgets.

Like any new technology, there are a number of issues to be worked out, such as how the remote treatment of patients will ultimately affect the quality of care health care givers deliver and whether a doctor will be more prone to miss symptoms he would otherwise catch, need to be worked out.

While the medical robot will never replace the human touch, solutions such as the Companion enables fewer caregivers to provide consistent, high-quality services to a greater number of both patients and staff members.

With the baby boomer generation reaching their golden years, increasingly complex medical capabilities and a diminishing number of trained professionals capable of providing care, the use of this technology will enable greater efficiency and extend the reach of health care.

Al Massey is a Houston-based freelance writer in the technology and energy industries.

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