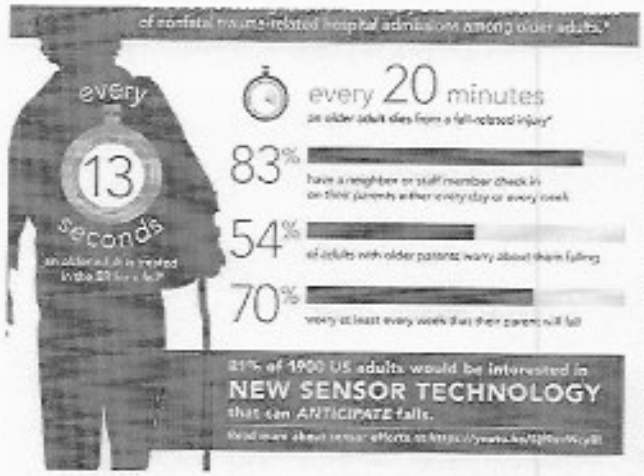
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Carnegie Mellon engineers develop fall-prevention sensors

25 May 2016, by Tara Moore



Credit: Carnegie Mellon University Electrical and Computer Engineering

Carnegie Mellon University's College of Engineering conducted a survey on falls among the elderly, and discovered that Americans are very worried about their elderly parent falling—and that this worry leads to action.

Every 13 seconds, an older adult is treated in the emergency room for a fall. Every 20 minutes, an older adult dies from a fall-related trauma. It's understandable, considering these statistics, why the College of Engineering survey found that 54% of 1900 U.S. adults are worried about an older parent falling, and why 81% of respondents expressed an interest in new sensor technology that can anticipate and prevent falls.

Two researchers, Associate Research Professor of Electrical and Computer Engineering Pei Zhang and Assistant Professor of Civil and Environmental Engineering Haeyoung Noh, are currently developing such active fall-prevention sensors for both senior care facilities and private homes that can determine both who is in danger and where they are. Their technology monitors an individual's gait and can send mobile alerts not only to nurses and caregivers but also to the individual themselves if their gait changes threateningly. While the goal is to anticipate and prevent falls, the technology is programmed to immediately notify someone, which can include emergency responders, should an individual experience a sudden fall—even if the person is unconscious.

"Many older adults in senior care facilities are restricted to wheelchairs when not under the direct care of a nurse, but this technology could allow them to regain some of their independence," says Noh, whose sensors are currently being tested at Vincentian Home in Pittsburgh and Lucas Physical Therapy and Fitness in Sunnyvale, California.

Of the 1,900 people in the survey, a little over 1,000 adults are concerned their parent may experience a fall, and 70% of these individuals worry at least every week, if not every day. The frequency and amount people worry is not influenced by whether the parent lives by themselves or not, though people are slightly less troubled if the parent lives in an assisted living or senior care facility. However, 62% of those with parents in assisted living or senior care facilities still worry once a week or every day.

All of this anxiety explains why, according to the survey, people are very responsive about caring for their parents. They frequently visit their parents, and also have neighbors or staff who look after them. 44% of respondents said they or a sibling checks in on their parent daily, while 33% said they or a sibling checks in every week. Another 12% said they stop by as needed. In addition, 56% of respondents reported that neighbors or staff physically check on their parent daily, while 27% said someone visits every week.

Although there was no difference among gender or

age, the survey did discover that those with higher education levels and higher incomes worry less. The survey does not suggest why this may be, but it does show that those with higher incomes are not more likely to have their parent in a senior care facility or assisted living facility, nor are they more likely to have a live-in caretaker for their parent. However, it does appear that more people with higher incomes have Life Alert® for their parents—although only 15% of respondents have parents with Life Alert®.

"Our sensors are designed to predict and anticipate falls so individuals can worry less about their parents with the knowledge that our technology will discover their parents are not walking the way they normally do, whether because of medication or because they've become fatigued," says Zhang.

About the survey: The first part of the survey included 1,900 adults representative of the U.S. population, while the second portion screened for the 1,000 adults among the original 1,900 who said they are worried about their parent falling. The survey was conducted with new sensor research at Carnegie Mellon University in mind to gain insight into how many people are worried about falls, what actions they take, and also to discover breakdowns for anxiety by demographic.

Provided by Carnegie Mellon University Electrical and Computer Engineering

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