



FALL PROTECTION, PREVENTION AND THE USE OF TECHNOLOGY

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ALOA WEBINAR SERIES

OUTLINE

- Background
- Aging population and associated fall trends
- Physiological and physical impacts of falls
- Reality of falls
- Technology
- Fall protection systems

BACKGROUND

- Social Gerontologist
- PhD – VP of Gerontology at Dele Health Tech
- Adjunct Professor at University of Maryland Global Campus and Chaffey College
- ALOA Board Member

AGING POPULATION

Americans ages 65 and older will more than double over the next 40 years, reaching 80 million in 2040

Adults ages 85 and older, the group most often needing help with basic personal care, will nearly quadruple between 2000 and 2040

FALL TRENDS RELATED TO OLDER ADULTS

Every Second of Every Day an Older Adult Falls

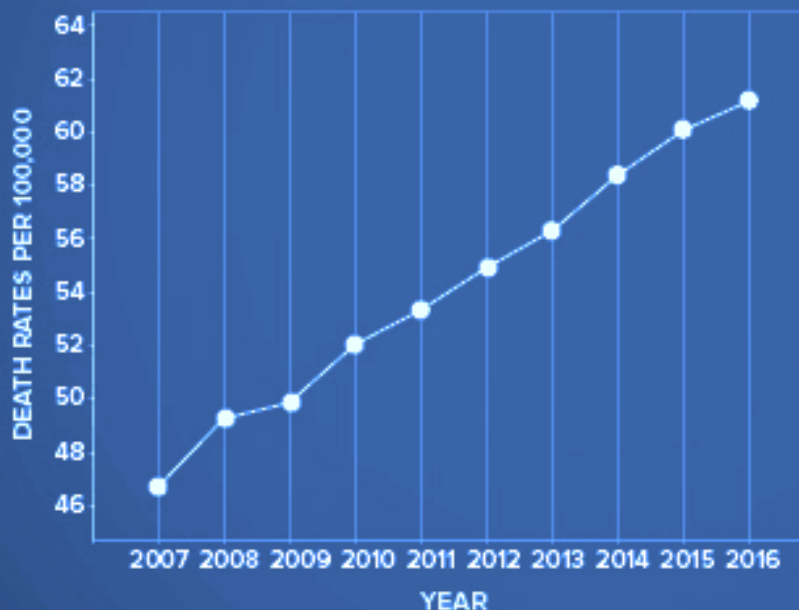
- **70%** of Senior Deaths are due to fall-related injuries
- **\$12 Billion** are paid annually and related to the costs of non-fatal falls
- **30%** of Falls are undetected for long periods of time

FALL REALITY

The CDC data suggests that by 2030, **1,460,000 Deaths** may occur each year from senior falls.

Fall Death Rates in the U.S. INCREASED 30%

FROM 2007 TO 2016 FOR OLDER ADULTS



If rates continue to rise,
we can anticipate

**7 FALL
DEATHS**
EVERY HOUR
BY 2030

Learn more at www.cdc.gov/HomeandRecreationalSafety.



COST OF OLDER ADULT FALLS

\$50 billion is spent annually on medical costs related to non-fatal fall injuries

\$754 million is spent related to fatal falls

Non-fatal falls

- \$29 billion is paid by Medicare
- \$12 billion is paid by private or out-of-pocket payers
- \$9 billion is paid by Medicaid

We can expect the number of fall injuries and the cost to treat these injuries to soar with aging population

PHYSICAL IMPACT OF FALLS

A fall can result in the following:

- Increased risk for mortality
- ADL and IADL deficits
- Social isolation
- Poor QoL
- Functional loss
- Broken bones and fractures
- Loss of independence
- “Long-lie” – 80% of people spending more than 1 hour on ground died within 18 months and 50 % within 6 months

PSYCHOLOGICAL IMPACT OF FALLS

Fear of falling:

- Stops activity
- More falls
- More fear
- Negative thinking

CAUSE OF FALLS

- Person factors
- Environmental factors
- Triggers

FALL PROTECTION TECHNOLOGIES

- Complex and multi-faceted
- Categorized in 2 main categories
 - Context Aware Systems – sensors are deployed in the environment to detect falls
 - Sensor based systems – wearable, non-wearable, radar and optic sensors
 - 1st generation e.g. panic buttons, pendant alarms
 - 2nd generation e.g. accelerometer sensors
 - 3rd generation e.g. radar sensors and cameras
- Trends: vision/smartphone based detectors and machine learning/AI

BARRIERS AND ISSUES

- Performance
- Usability and limitations
- Acceptance
- Privacy and dignified tech
- Data fusion and integration
- Real life falls

CURRENT AND FUTURE TRENDS

- Increased focus on the use of technology in assessment of fall risk
- Increased involvement of healthcare professionals in the design process
- Increased involvement of older adults in the design process and in piloting the device before main study and commercialization
- Larger scaled studies needed
- Focus on older adult population with cognitive impairment.

CONCLUSION

- Technology use in fall prevention and timely detection has an impact on many levels; physiological, psychological and economically
- Future design of fall detection systems and fall risk assessments should include healthcare professionals and older adults
- Cost of the equipment should be considered during the design phase
- Larger scaled studies needed to explore the older adults experience of using and acceptance of fall systems