Technological Revolution: Falls and Injury Prevention

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How is it we can put a man on the moon, but we can’t prevent older people from falling?


FALLS ARE THE LEADING CAUSE OF INJURIES AMONGST SENIORS

95% OF ALL HIP FRACTURES & 40% OF ALL NURSING HOME ADMISSIONS ARE A DIRECT RESULT OF FALLING

1 OUT OF 3 ALBERTANS OVER 65 WILL FALL AT LEAST ONCE A YEAR

1 OUT OF 2 ALBERTANS OVER 80
Alberta Health, Health Standards, Quality and Performance Division, Analytics and Performance Reporting Branch, 2017
Authors' conclusions

Group and home-based exercise programmes, and home safety interventions reduce rate of falls and risk of falling.

Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling; Tai Chi reduces risk of falling.

Overall, vitamin D supplementation does not appear to reduce falls but may be effective in people who have lower vitamin D levels before treatment.

Authors' conclusions

In care facilities, vitamin D supplementation is effective in reducing the rate of falls. Exercise in subacute hospital settings appears effective but its effectiveness in care facilities remains uncertain due to conflicting results, possibly associated with differences in interventions and levels of dependency. There is evidence that multifactorial interventions reduce falls in hospitals but the evidence for risk of falling was inconclusive. Evidence for multifactorial interventions in care facilities suggests possible benefits, but this was inconclusive.
What is the solution?
“Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them.”

Steve Jobs
Age-Friendly Cities and Communities

- SMART Cities
- Interactive television
- Medication management tools
- Body sensors
- Robotics
- Autonomous vehicles
Wearable Technology

- Motion Device
- Alarms
- Pressure Sensor
- Rechargeable Battery

- Cellular 2G/3G/4G
- GPS
- 1 Minute Location Breadcrumbs
- SOS Button 2-Way Voice
- Fall Detection Caregiver Alert
- Multiple Geo-Fence Safe Zones
- Water Resistant
- Lockable Clasp Tamper Alerts
- Bluetooth™ Technology

November-15-17
Smart phone adoption among seniors has nearly quadrupled in the last five years

% of U.S. adults who say they have or use the following

Source: Survey conducted Sept. 29-Nov. 6, 2016. Trend data are from previous Pew Research Center surveys. "Tech Adoption Climbs Among Older Adults"
“As is true for the population as a whole, there are also substantial differences in technology adoption within the older adult population based on factors such as age, household income, and educational attainment.”

PEW Research Centre (May 2017) Tech Adoption Climbs Among Older Adults
Things You No Longer Need
Because of Smartphones

Mail
It's the digital age, yet falls prevention apps are few and far between
Fall Prevention App

Is there an app for that?

- Mobile phones detect and classify falls
- Options available for all preferences and budgets
Hip Protectors

• Special garments (underwear, shorts or pant)
• Soft pads protect hips
• Promoted across Canada for high-risk populations
- Ranged -7% to 40% force reduction
Hip Protector Placement

Hip Saver
Hip Protectors reduce risk for hip fracture by up to 80% if worn at time of falling
Stick-on Hip Protectors

1. Increase force attenuation
2. Pad secured in place
3. Continuous protection
4. Decrease staff workload
5. No laundry requirements
6. Not patient specific
7. Lower unit cost
Inflatable Hip Protectors

- Safety belt
- Instantly inflates when it detects wearer is falling
- Motion sensors
- Compressed air
Compliant flooring

- Flooring system with shock absorbency
- Cushioning technology
- Respond dynamically like springs
- Doesn’t impair balance
Force Reduction provided by SmartCells during a simulated fall on the hip averaged 34%, exceeding most commercial hip protectors.
Force reduction provided by SmartCell during a simulated fall on the head averaged 70%
Virtual reality
Robotic Movement Sensing System

- Kinect-style home monitoring system
- Predicts fall risk
- 86% chance of falling with declined walking speeds
- Identify UTI’s
Robotics

ICCER Falls Risk Management Conference, November 2017
“The advance of technology is based on making it fit in so that you don't really even notice it, so it's part of everyday life.”

Bill Gates
Thank You

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