

Technology Enhances Outcomes in Older Adults

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Funding

- National Institutes of Nursing Research
- Pace University Lienhard School of Nursing Nursing Research Endowment Award

- DX Web/Next Gen LLC



- Jamaica Hospital Medical Center Ferrara Family Hospice Unit Fund
- New York City Economic Development Corporation Pilot Health Tech NYC

The Research Team

- Two Co-PIs
- Project Manager: Nursing PhD student
- Research Assistants:
 - 2 Graduate Nursing Students
 - 6 Undergraduate Nursing Students
 - 1 Undergraduate Health Science Student
 - 1 Undergraduate computer science student
- Coverage in hospital: 7 days/week

Delirium Background

Delirium occurrence rates for older persons in the hospital setting range from 29-64%.

- Postoperative: 12-51%
- Intensive care: 19-82%
- Nursing home: 20-56%
- Palliative care: 47%
- Stroke units: 27%
- Emergency room: 8-17%

Delirium is only recognized by:

- About 1/3 of physicians
- About 1/3 of nurses

Adverse outcomes with delirium

Outcomes	Adjusted Relative Risk
Prolonged length of stay	1.4-2.1
Mortality	1.5-1.6
Institutionalization	2.5
Functional decline	1.5
Cognitive decline/Dementia	6.4-41.2

- Hospital costs (> \$11 billion/yr)
- Post-hospital costs (> \$153 billion/yr)

- Rehospitalization
- Emergency department visits
- Institutionalization

Delirium is preventable!
30-40% of delirium is preventable through multicomponent targeted interventions.

Delirium Association with Falls

Falls in the General Hospital: Association With Delirium, Advanced Age, and Specific Surgical Procedures

Article in *Psychosomatics* 50(3):218-26 · May 2009 with 64 Reads
DOI: 10.1176/appi.ps.50.3.218 · Source: PubMed

1st [Barbara E Lakatos](#)
il 8.08 · Brigham and Women's Hospital

3rd [Monique T Mitchell](#)



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Last
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Abstract

Falls and delirium in general-hospital inpatients are related to increased healthcare costs. Patients fall despite safeguards and programs designed to determine the prevalence of diagnosed and undiagnosed delirium during their hospital stay. The authors performed a retrospective electronic review of hospital stay. Falls were categorized by their severity. Demographic information, patient outcomes, and diagnostic criteria were collected on the day of admission, the day of the fall, and the 2 weeks after the fall. The general hospital were associated with delirium (both diagnosis

Journal List > Perm J > v:17(4); Fall 2013 > PMC3854806



Perm J. 2013 Fall; 17(4): 32–36.
doi: [10.7812/TPP/13-065](#)

PMCID: PMC3854806

Making Hospitals Safer for Older Adults: Updating Quality Metrics by Understanding Hospital-Acquired Delirium and Its Link to Falls

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Clin Interv Aging. 2014; 9: 2013–2018.
Published online 2014 Nov 21. doi: [10.2147/CIA.S71033](#)

PMCID: PMC4246925

Delirium markers in older fallers: a case-control study

[Kelly Doherty](#),¹ [Elizabeth Archambault](#),¹ [Brittany Kelly](#),^{1,2} and [James L Rudolph](#)^{1,3,4}

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Abstract

Go to:

Background

When a hospitalized older patient falls or develops delirium, there are significant consequences for the patient and the health care system. Assessments of inattention and altered consciousness, markers for delirium, were

affairs referral center identified falls in older fallers with complete delirium risk assessment matched at a 3:1 ratio. Admission to consciousness, cognitive function (R) was reported (95% confidence

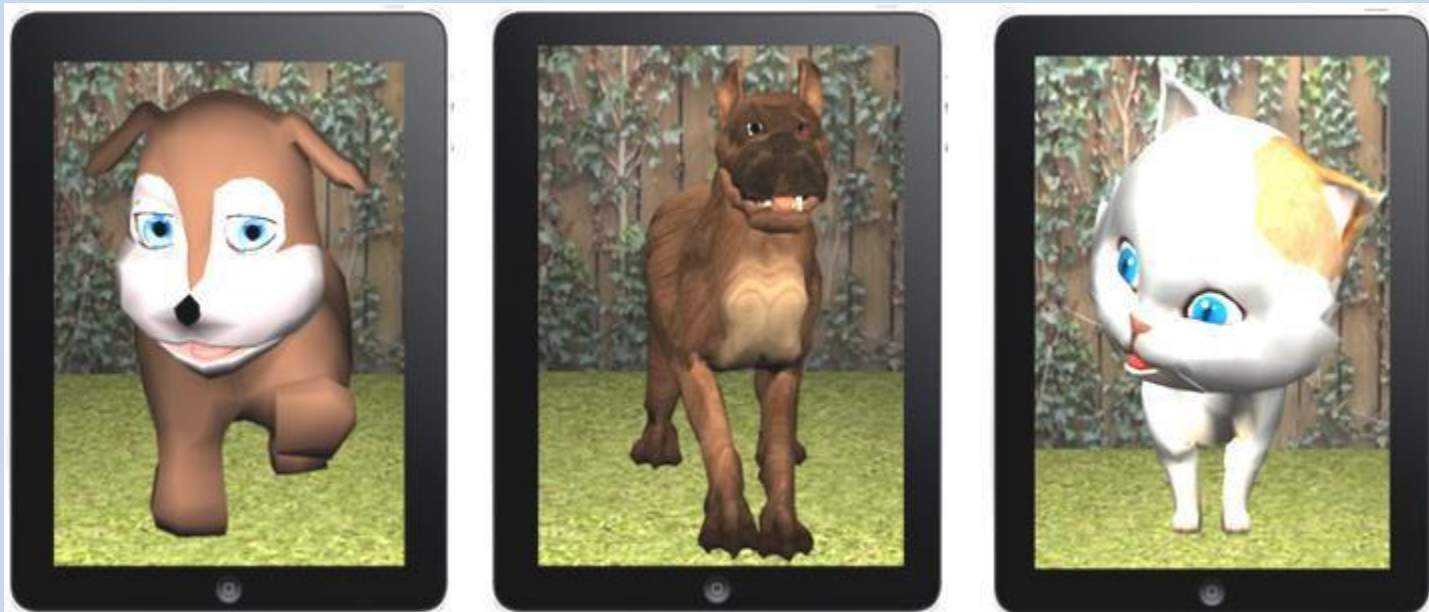
on age (74.4±9.8 years) and ward level Months of the Year Backward test (1–3.7). Fallers tended to have altered consciousness (3–5.8).

preceded prior to falling, were more

The Setting

- Income levels are lower than average for NYC with the majority of insured residents receiving Medicaid and/or Medicare benefits. 25% of the population is uninsured, usually due to undocumented immigration status.
- Levels of education and health literacy are among the lowest in NYC.
-

Technology



A tablet-based digital avatar that can see, hear, and talk with a patient using speech-to-text technology

Instruments

- Cognition: Mini Cog
- Delirium: CAM
- Loneliness: 3 item UCLA loneliness questionnaire
- Depression: Geriatric Depression Scale (15 item)
- Demographic data
- Falls
- Hours of restraint use

Study #1 2016: “Use of an Avatar-Enhanced Care Team to Improve Outcomes in Hospitalized Older Adults”

- Setting: Jamaica Hospital Medical Center, Jamaica, New York
- Sample Size: 95 patients, of which half had a care.coach avatar.
- Patients were enrolled from 3 inpatient medical-surgical units.
- The avatar was used as a social conversational agent.

Study #1 2016: “Use of an Avatar-Enhanced Care Team to Improve Outcomes in Hospitalized Older Adults”

Results:

Hospitalized older adults who had an avatar virtual service animal experienced less delirium, loneliness, and falls as compared to control group who received only a daily “friendly visit” from a nursing student

Study #1 2016: “Use of an Avatar-Enhanced Care Team to Improve Outcomes in Hospitalized Older Adults”

- Cost of internet access was a limitation of study, particularly post discharge, for this group of economically disadvantaged older adults.
- Feedback from participants:
 - “I love the avatar, but it is not cuddly. Pets are supposed to be cuddly”
 - “I want to hug my kitty”
 - “I miss the fur”

Study #2 Robotic Animals Improve Outcomes in Hospitalized Older Adults

The Technology



Study #2 Robotic Animals Improve Outcomes in Hospitalized Older Adults

Study Aim: To investigate the impact of a robotic animal on hospitalized older adults.

- Outcomes Investigated: Delirium, depression, loneliness, cognition, falls, restraint use
- Setting: Jamaica Hospital Medical Center, Jamaica, New York
- Six Medical-Surgical Units and one Hospice Unit

Study #2 Robotic Animals Improve Outcomes in Hospitalized Older Adults

- Randomized Controlled Trial
- No randomization on Hospice Unit
- 180 subjects
 - 80 subjects with robots
 - 80 controls
 - 20 hospice patient subjects

Instruments

- Cognition: Mini Cog
- Delirium: CAM
- Loneliness: 3 item UCLA loneliness questionnaire
- Depression: Geriatric Depression Scale (15 item)
- Demographic data
- Falls
- Hours of restraint use

Results

- Study participants with robots are experienced greater improvement in loneliness than control patients.
- Mean pre and post scores on depression not significantly different in either control and experimental groups.
- There were too few incidences of restraint use for statistical modeling.

Qualitative Results: Patient Feedback

- “I love it.”
- “The puppy makes me happy.”
- “I am calmer”
- “My father loves his pet, he thinks it is real. It calms him down”
- “All hospitals should be doing this. It is wonderful.”

Nursing Staff Feedback

- “This is a wonderful project. It is just great. I am thrilled that the study is happening on my unit. It is good for the patients.” (Nurse Manager)
- “It is great. I talk to the robot every time I come to care for my patient.”
- “It makes a difference for the patients.”

Conclusions

- The use of a robotic animal decreased delirium, falls, and loneliness.
- Results were similar to the avatar study.
- Robots are high impact for low cost compared to avatars. Very important for safety net facility and continuity of intervention post-discharge.

Study #3: A Protocol-Driven, Digital Conversational Agent at the Hospital Bedside to Support Nurse Teams and to Mitigate Delirium and Falls Risk

Study Aim: To investigate the impact of an avatar delivering HELP (Hospital Elder Life Program) protocols on delirium incidence and severity, falls, restraints and sedatives compared to usual care

- Site: Jamaica Hospital Medical Center, six medical surgical and rehab units
- Randomized controlled trial
- 3650 patients over 2 years

Study #3: A Protocol-Driven, Digital Conversational Agent at the Hospital Bedside to Support Nurse Teams and to Mitigate Delirium and Falls Risk

- Study in progress
- 80 patients enrolled, about 40% with avatar, 60% controls
- Initial results: Patients with avatars less likely to fall and decreased rate of delirium

Summary and Conclusions

- Technological interventions have great promise for improving outcomes for hospitalized older adults.
- Older adults are able to use technology interventions and enjoy doing so.
- Access to internet remains a major roadblock to implementing technology that relies on internet access

Thank You

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