Reducing Falls with Artificial Intelligence

The Problem
Every year, one in three seniors fall, resulting in well over $50 billion in annual medical costs. Over 3 million seniors are treated in Emergency Departments each year for fall-related injuries. Falls are the leading cause of injury-related deaths for seniors. In 2016, nearly 30,000 people ages 65+ died from a fall. As the U.S. population ages rapidly, the number of falls occurring each year continues to rise. From 2007 to 2016, the rate of fall-related deaths rose 31%.

Reducing Falls with Artificial Intelligence
At VirtuSense, our mission is to revolutionize care for seniors by reducing adverse events using artificial intelligence (AI). The first product we developed is an AI system called VSTBalance, which uses predictive analytics based on balance and gait analysis to identify deficits and forecast risk. By implementing VSTBalance, partners of ours have seen a reduction in falls in excess of 43% across the continuum of care.

Measurable, Actionable Results
Skilled Nursing Case Study: 4,000 residents in 37 SNFs across three years according to CMS data. In 2017, when VSTBalance was implemented, these communities averaged 12.7% of their residents falling each year. In 2018, after a year of using the system, the average fell to 3.3%. This resulted in 380 fewer falls compared to 2017. The cost savings from the reduced falls equates to $11.4 million across these communities.

Expected Quality Improvements
- Each facility will achieve a 10% reduction in falls and falls with injury in CY 2021 and CY 2022.
- Residents that were identified to have balance and function deficiencies and were provided treatment will show on average an improvement of at least 10% in balance and function assessment scores in CY 2021 and a 10% average improvement in balance and functions scores in CY 2022.

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Figure A (VSTBalance)

<table>
<thead>
<tr>
<th>No. of Weeks</th>
<th>Last Visit Date</th>
<th>Fall Speed (m/min)</th>
<th>TUG Time (sec)</th>
<th>Long Score (0-5)</th>
<th>Treads Score (0-5)</th>
<th>Forward Reach (in)</th>
<th>MC3 5x5 Score (0-6)</th>
<th>Sit to Stand (sec)</th>
<th>Follow Up</th>
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Figure B (Cloud Risk Board)

ltcquality.ohio.gov
Brief Description of Required Activities

The facility will adopt and implement this training as part of their general policy and operations to improve the quality of care and reduce the number of falls occurring in the facility.

**Phase I**

a) Participating facility and Administrator sign participation agreements;
b) Training on how to utilize VSTBalance—a 2-day program taught by Outcomes Success Consultants from VirtuSense Technologies;

**Phase II**

c) Begin mobility and functional evaluations for residents utilizing the machine vision and artificial intelligence of VSTBalance. Develop a schedule of routinely screening residents to evaluate mobility level, functional status, and fall risk likelihood;

**Phase III**

d) Evaluation of data and continued screenings—monthly calls will be held for the duration of the project to evaluate the data being generated, as well as the progress towards the intended quality improvement metrics. Figure C depicts an example of the type of data able to be automatically generated and exported to evaluate outcomes improvements.

![Figure C (VSTBalance Cloud Outcomes Export)](ltcquality.ohio.gov)
Phase IV

e) Quarterly review of data—evaluating quality improvement progress in reducing falls and improving mobility for residents. At the conclusion of the project create summary of project experience and lessons learned as well as final outcomes achieved.

Date(s) of Project
January 1, 2021 – December 31, 2022

Evidence of Participation in the Project*

*Expected evidence of participation in the project should be kept by the nursing home for use in state survey to demonstrate compliance with Sec. 3721.072 (B) which states that “Beginning July 1, 2013, each nursing home shall participate every two years in at least one of the quality improvement projects included on the list made available by the department of aging under the nursing home quality initiative established under section 173.60 of the Revised Code.”

- Signed Project Participation Agreement from the participating nursing facility;
- Cloud data usage report created automatically when the system is utilized; and
- Quarterly review of Risk Board Export (see Figure C) documented by QAPI team.

How to begin this quality improvement initiative:

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Relevant links

https://virtusense.ai/

Reducing Falls with Artificial Intelligence CMP Proposal