

AI-Driven Fall Predication and Prevention Tools



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Falls Are a Strategic Problem

- Falls among older adults are the top cause of injury, with over 14 million(1 in 4) falling each year and about 37% resulting in injuries requiring care. [1]
- Falls are not just clinical events; they are operational events.

They affect:

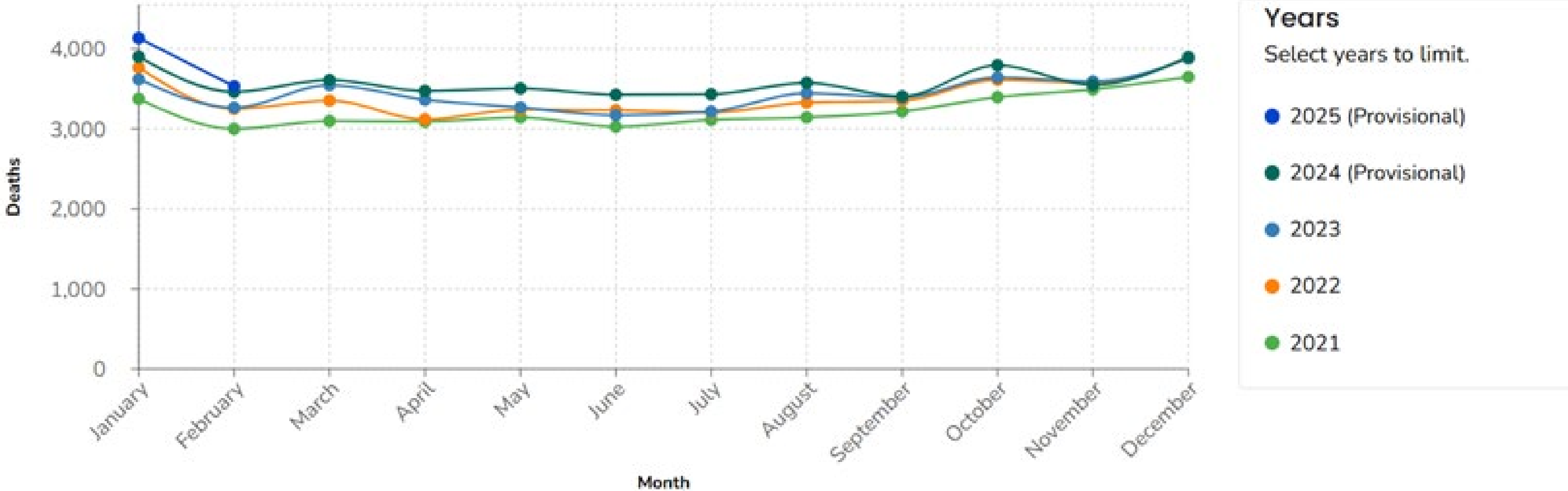
- Your staffing
- Your compliance
- Your finances
- Your reputation



Provisional and Final Fatal Injury Data by Month, United States

Select Injury Type

Unintentional Older Adults Falls (Age 65 and Older)



Every fall triggers a Domino Effect

Incident Report

- Incident reports must be filled out by staff when a fall has occurred.
- This creates more work for staff to stay in compliance and increases burnout.

Possible hospitalization

- Resident safety and health concerns
- As hospitalizations happen more concerns appear that resident's care team must be responsible for in order to provide the best recover possible

Family communication

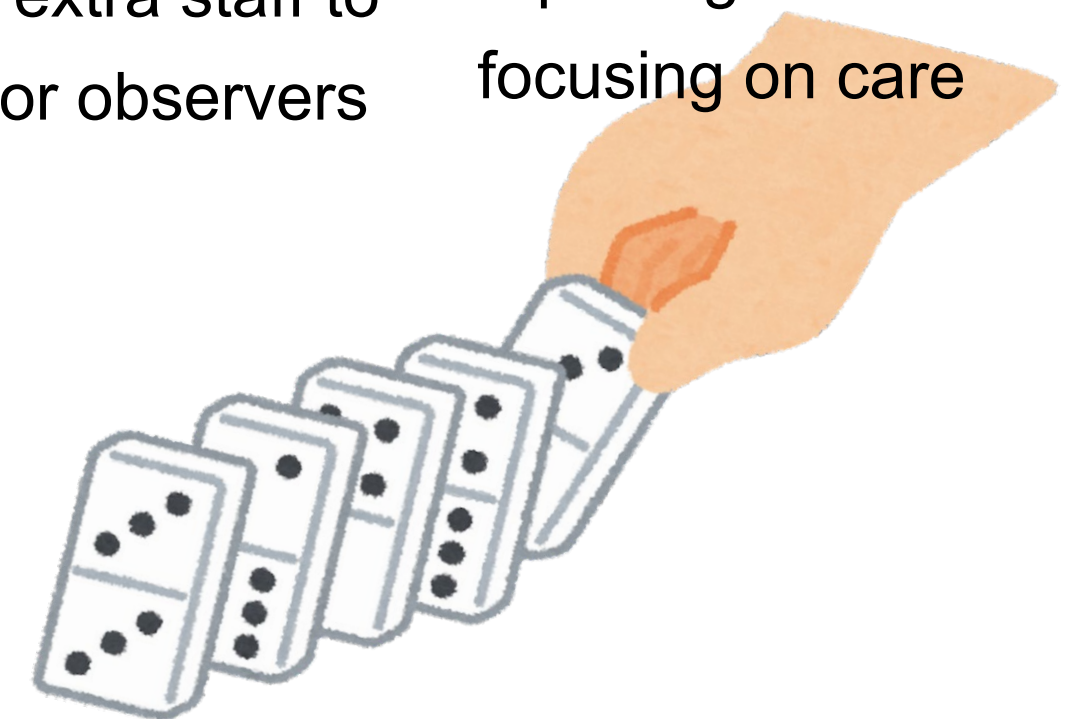
- Included with compliance is the report of fall of to the family.
- .This can create increased stress for both care teams and residents as sometimes families don't understand how or why things happened

Follow-up assessments

- Post fall observations and other assessments depend on severity of fall.
- This can increase cost by having extra staff to be sitters or observers

Care plan revisions

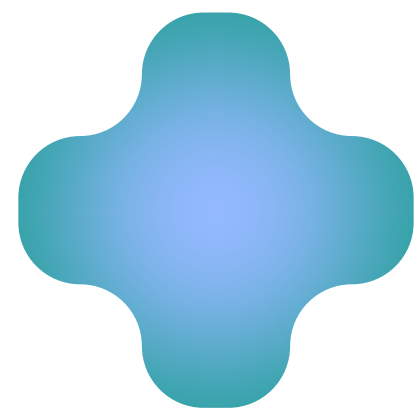
- Creating new care plans after hospitalizations
- This creates more time spent on reporting instead of focusing on care



Before the upgrades: Meeting Mr. Dumpty

- Lives in a nursing home on a non-secured unit
- He is apart of assisted living neighborhood of the facility
- He has a neurologic disorder and muscle weakness
- He is very independent and uses a walker for assistance with ADLs (Activities of Daily Living).
- 2:30 pm bathroom break is needed but Mr. Dumpty does not get his walker while getting up.
- Dumpty makes a step but falls in the process of walking to the bathroom. Now, we must enact our fall protocols to stay in compliance organization.
- How can we help this issue especially with Mr. Dumpty being a high fall risk.





What AI-Driven Fall Prevention Actually Is



AI is a facility operations' M.A.I.D
Always there to assist us

M= Monitor movement

- Being able to collect movement data.

A = Alert staff; before a fall happens

- EHR alerts to detail issues with residents to staff before fall happens

I = Identify risk

- Ability to see when issue arise with residents' vitals and/or what movements where before, during, and after fall

D= Detect patterns

- Ability to collect and learn from the data collected

Daily Operation Add-Ons

Wearable Devices

- Data Entry
- Reduce staff documentation
- Alert both resident and staff of potential falls

Video/Motion Detection

- Increase Staff relief by reducing resident to staff ratio
- Reduce nursing surveillance
- Can detail environmental issues

EHR system updates

- Call lights
- AI Alerts



What are wearables?

- Wearables are data that is feed into AI software in which the AI will then collect data and aid with alerts
- AI can use vital sign data to predict and learn fall trends on resident creating a space for patient centered care.



Wearable examples

- Pedometers
- heart rate monitor (HRM)
- Fall signal device



Video Monitoring

AI-powered fall surveillance is needed for systems to analyze live video, track movement patterns, and detect unsafe behaviors in real time, allowing staff to intervene before a fall occurs. Far surpassing what manual monitoring can achieve. [2]

Types of AI Video Monitoring

Computer-Vision Fall Detection

- Uses AI to analyze live video streams, recognize human posture, and detect when a resident is falling or has fallen. Systems like SafelyYou and KamiCare rely on deep-learning models trained on thousands of fall scenarios.

Behavior & Movement Pattern Analysis

- AI tracks gait changes, instability, wandering, or risky movements (e.g., unsafe transfers) to predict falls before they happen. These systems learn each resident's normal movement patterns and flag deviations.

Pose Estimation AI

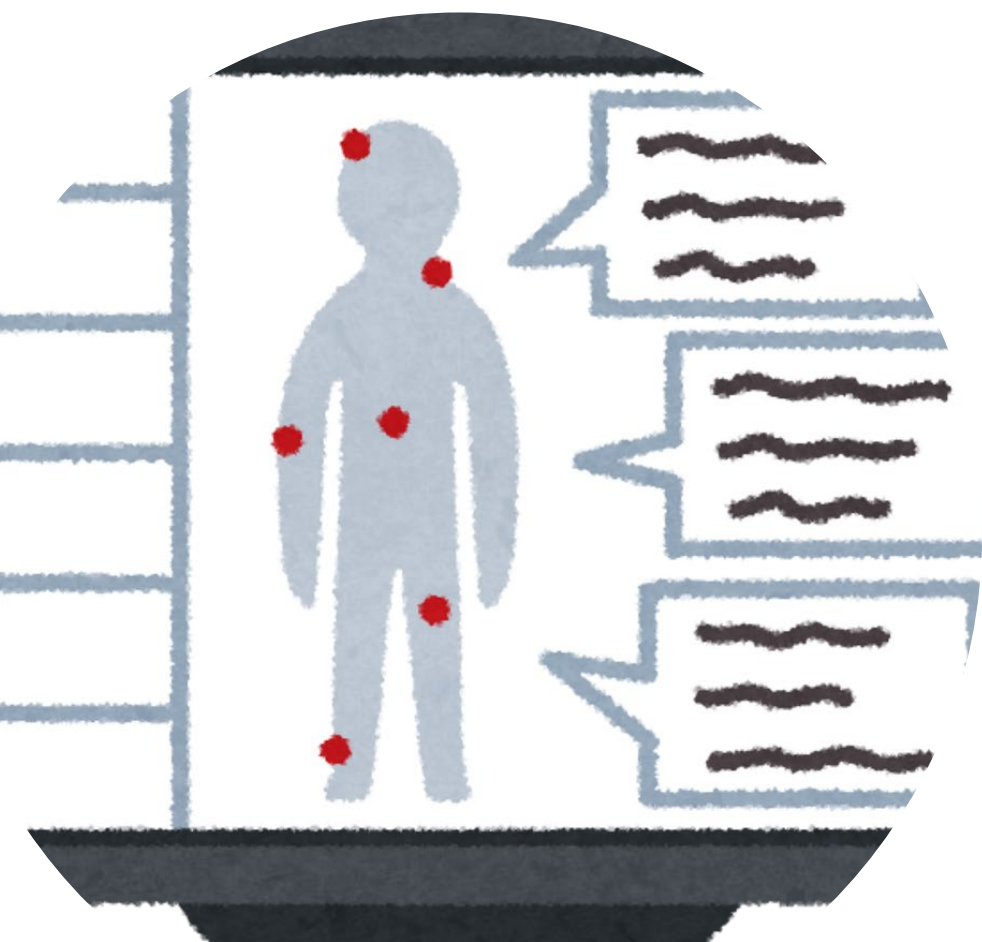
- Uses skeletal mapping to identify body angles, joint positions, and posture changes. This allows the AI to detect when someone is leaning, slipping, or attempting to stand unsafely.

SafelyYou uses AI-enhanced video monitoring to detect falls in real time, analyze residents' movement patterns, and alert staff within seconds. Its system continuously learns from behavior changes such as instability, wandering, or risky transfers. Allowing caregivers to intervene before a fall happens. [3]



EHR System upgrades

- Integration into current system
- Useful for alerts and reminders for residents with vitals that fall within the fall ranges.
- Allowing more personalized care for residents to increase their safety, and relieve some stress from staff
- Reduce burnout with reduction of data entry as data can be imported directly into EHR from wearables such as vitals.
- With enhancements to data collection, pre-fall alerts can be activated to signal



How AI Improves Daily Operations

Prioritization

- It has created and placed a higher prioritization on immediate care needs
- Help staff assist before fall is possible

Support Staff

- The main goal is to support staff not replace them
- Reducing burden = Reducing Burnout

Reduce Chaos

- By Prioritizing care when we first start to see signs then we prevent the domino effect of a fall.
- By Supporting staff, we reduce the chaos coming from falls and level of work.



How has AI done so far ?

Wearables

AI-driven sensor arrays in skilled nursing facilities analyze gait changes, nighttime restlessness, and bed-exit patterns to predict falls before they occur, reducing fall incidents by over 40% in multi-site clinical evaluations in a study with 28 skilled nursing facilities across six states. [4]

Video Monitoring

AI Video Monitoring had improved fall prevention by continuously analyzing resident movement, detecting unsafe behaviors, and alerting staff in real time, reducing time residents spend on the ground and enabling faster intervention

EHR System Upgrades

AI systems integrated with EHRs combine sensor data, medication profiles, diagnoses, and prior fall history to generate predictive fall-risk alerts, enabling proactive care planning and reducing documentation . We can see compliance audits as with a study after AI to EHR to help with documentation. Documentation increased by at least 10% in monthly basis. [4]



Reality of Implementation

Starting off small

- Focusing on a specific group or type of residents enables for easier integration.
- By starting with small changes, you reduce and spread cost over time making it easier for adaptations to be made.

Focus on Staff Adoption

- Make changes that support staff to make learning easier.
- Be able to know how much staff can handle dealing with AI software without being too overwhelming for them.

Choose the Right Partner

- Choosing the right software and AI partner is crucial.
- By being selective and proactive with an AI partner you can tailor software more towards your facility needs.

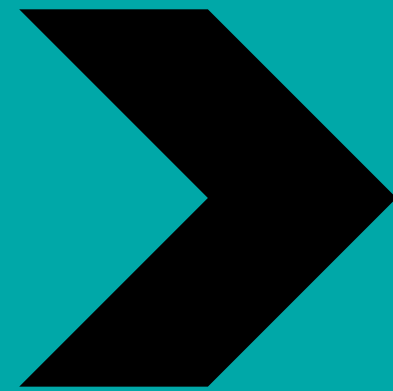


Financial and Regulatory Impact

AI-driven prevention

reduces:

- Fall rates
- Hospitalizations
- Emergency interventions



Leading

Organizations to:

- Lower costs
- Better outcomes
- Stronger compliance positioning



Financial and Regulatory Impact

Facility savings



Staff overtime

AI reduces the need for multiple sitters and extra help with resident watch. By adding video monitoring, staff can take breaks more efficiently, easily move around staff to residents that need priority care, and still account for all other residents

Administrative workload

AI analyzes the patient's data to detect early warning signs, predict potential issues, and provide us with data on demand. This lessens the responsibilities of staff and helps with data capture. Reducing the workload across a whole organization.

Increased care needs after injury

AI-assists with check-ins and personalized treatment plans to improve both patient outcomes and quality of life. As it can keep track on progress during rehabilitating to from any This in turn decrease chance of reinjuring or rehospitalization.

Facility exposure

As an AI-assisted facility, You get exposure just for having it. Marketing is based of facility abilities both with human and technology aiding in the quality-of-care process for residents. This is something that at moment not all can say. Bring revenue for specializing in certain watches like those who are high risk fall residents.

Conclusion

- AI can be a big difference for care facilities and rehabs with fall prevention advancing technology.
- It has already shown that it can decrease fall morality and facility operations cost.
- AI is useful to all of us with an increase to fall prevention, quality of care, and cost effectiveness. So why not use it to keep our resident Mr. Dumpty safe and upright.



References

1. Centers for Disease Control and Prevention. (2024). Older adult falls: Data & research. <https://www.cdc.gov/falls/data-research/index.html>
2. Jain, S., & Burke, C. (2024). Falls Prevention Using AI and Remote Surveillance in Nursing Homes. *Journal of the American Medical Directors Association*, 25(8), 105082.
<https://doi.org/10.1016/j.jamda.2024.105082E>
3. Bayen, A. M., Bayen, A., Bui, A. A. T., Li, J., & Stone, E. (2021). Reduction of time on the ground related to real-time video detection of falls in memory care facilities. *Journal of Medical Internet Research*, 23(12), e28632. <https://doi.org/10.2196/28632>
4. Sun, C., & Burke, C. (2025). Falls in assisted living facilities: Can AI improve documentation and reduce injury? medRxiv. <https://doi.org/10.1101/2025.10.10.25337770>