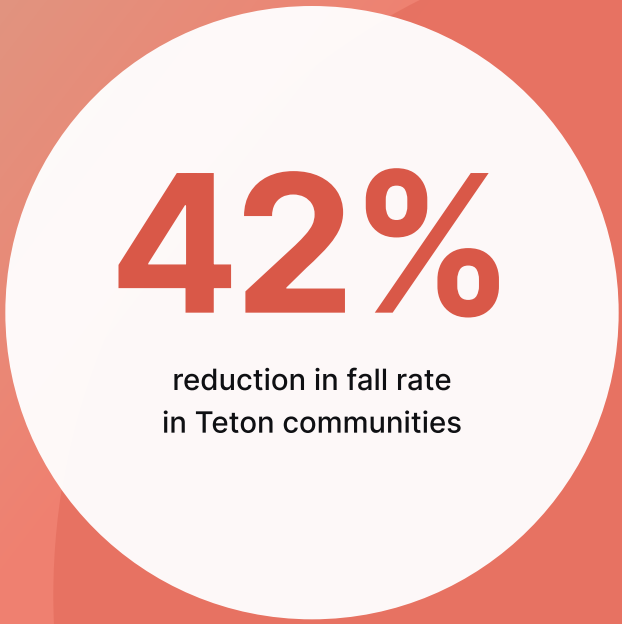


A TETON RESEARCH REPORT

Anatomy of 2,000 Falls

What 853 residents and 3,000,000
transitions tell us about preventable falls
in care homes.



42%

reduction in fall rate
in Teton communities

EXECUTIVE SUMMARY

Falls are not random. They concentrate.

Falls are the single largest source of preventable harm in residential care, and one of the largest sources of preventable cost. Most operators already know this. What they often lack is a clear, evidence-based view of which falls are actually preventable and where intervention creates the greatest impact.

We built one. Between October 2025 and March 2026, Teton's ceiling sensors analysed 2,000+ confirmed falls across 853 residents in care communities in the United States, Denmark, the United Kingdom and Switzerland; together with more than three million state transitions in the days and minutes preceding those falls.

42%**Fall rate reduction**

Communities using Teton reduced falls from 11.3 to 6.6 per 1,000 patient-days, concentrated in transitions from supported to unsupported positions.

79%**Avoidable share**

Of falls in care settings, 79% involve an identifiable intervention opportunity. Configuration and workflow gaps drive the majority.

21%**Too fast for reactive alerts**

In the rest, the transition and the fall happen within the same minute. These need earlier risk identification, not a faster alarm.

"Most preventable falls are operational failures, not clinical inevitabilities."

PART 01

The Operator Stakes

A single fall in a care community costs more than the resident's hospitalisation. It costs the family meeting that follows, the regulatory follow-up, the staff time spent on the incident report, the conversation with the referring discharge planner, and over time, the occupancy cost of being a community known for falls rather than known for safety.

Public health and CMS data put the average direct medical cost of a fall with injury in the tens of thousands of dollars per event once hospitalisations and downstream care are included, and that excludes the operational and reputational costs that fall to the community itself.

AT 100 BEDS

~400

falls per year at a baseline rate of 11 per 1,000 patient-days. A 42% reduction prevents roughly 168 falls and the costs that follow.

11.3 → 6.6

falls per 1,000 patient-days

PART 02

What 2,000 Falls Actually Look Like

The most useful thing a fall analysis can do for an operator is shift the question from "how do we stop falls?" to "which falls, and which moments?" Fall risk is not evenly distributed. It concentrates around specific transitions, times of day, and resident conditions.

The Dangerous Transitions

The Teton sensor classifies a resident's activity 10× per second across fourteen states - lying, sitting, walking, in a wheelchair, in the bathroom, and so on. A transition is any movement from one state to another. The transfer from a supported position into an unsupported one is the moment of maximum instability and where the majority of preventable falls occur.

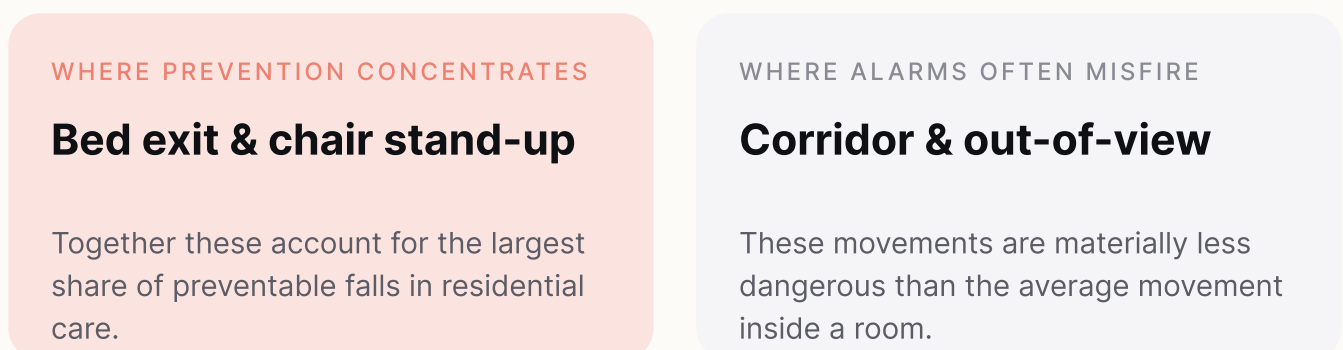
TRANSITION	FALL RISK VS. BASELINE
Getting out of bed	2.5× more likely
Getting up from a chair	1.6× more likely
Going to / from out of view (corridor)	2–3× less likely
Bed → out of view (or vice versa)	~10× less likely

FIGURE 01:

The two transitions that account for most preventable falls.



The transition from a supported position to an unsupported one is the moment of maximum instability. Many alarm systems generate noise on the wrong transitions while under-alerting on the moments that matter most.



TIME OF DAY

When falls happen.

A transition at 3 AM is 63% more likely to result in a fall than the same transition at 3 PM. Reduced staffing, darkness, disorientation from waking, and medication effects all play a role but the magnitude is what stands out. Night-time monitoring is not an enhancement to fall prevention. It is where the highest concentration of preventable risk exists.

RELATIVE TO AFTERNOON BASELINE

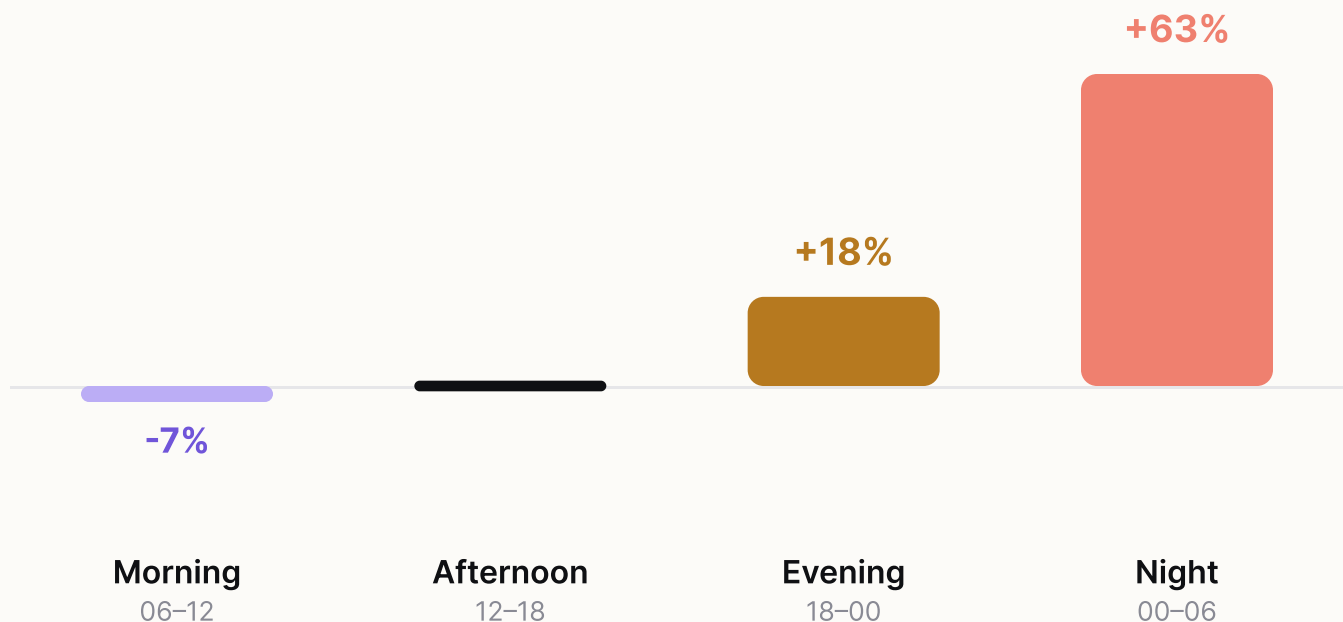


FIGURE 2: Fall likelihood by time of day, relative to the afternoon baseline.

**Night-time monitoring isn't "nice to have."
It is where the majority of preventable risk sits.**

TIME IN STATE

Inactivity is a risk multiplier.

The longer a resident remains inactive before moving, the more dangerous the next transition becomes. A resident who has been lying in bed for over an hour and then moves to standing is 2.4× more likely to fall than one who has been resting for less than fifteen minutes.

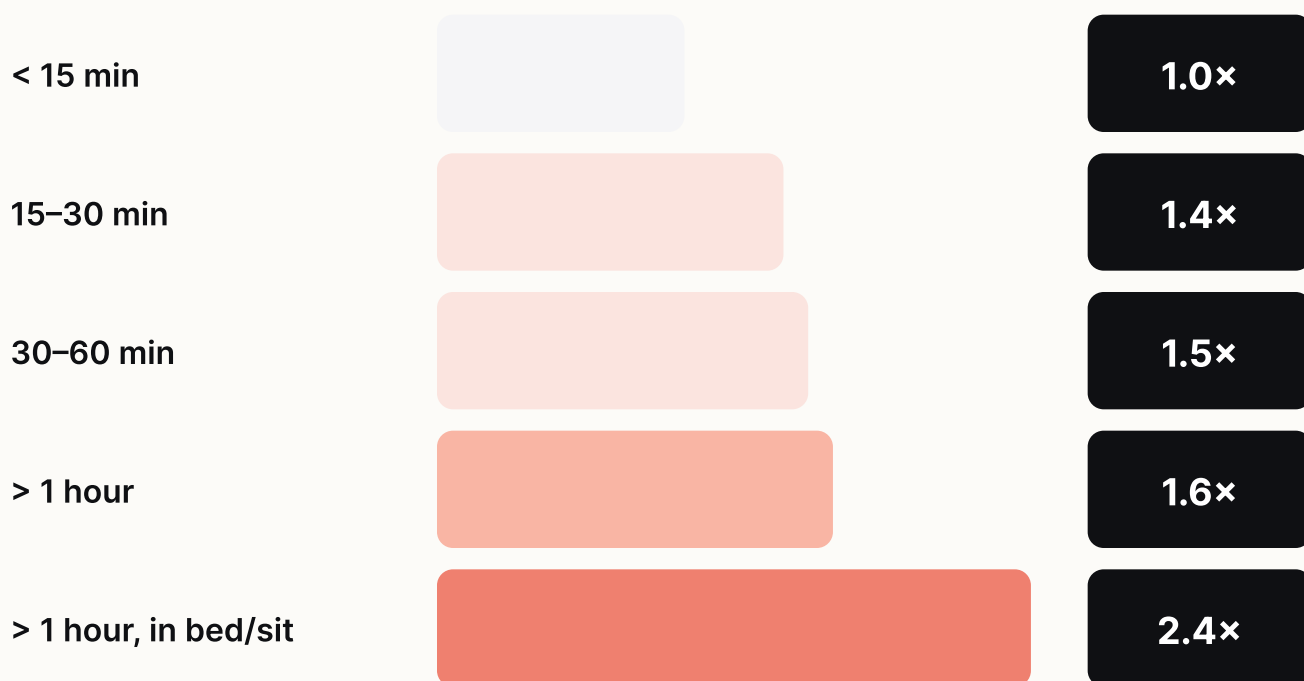


FIGURE 3: Inactivity compounds risk: time in the previous state is a multiplier on the next transition.

OPERATIONAL IMPLICATION

A bed-exit alert at night after one hour of inactivity is fundamentally different from the same transition after five minutes and should be treated accordingly.

RECENT HISTORY

The best predictor of falls is falls.

Residents who experienced a fall within the last 90 days are 5× more likely to fall again in the next 30 days. This is the strongest predictor in the dataset, stronger than any individual health metric, mobility-aid status, or sleep pattern.

FALL HISTORY (LAST 90 DAYS)



more likely to fall in the next 30 days.

Stronger than any single health metric, mobility-aid status, or sleep pattern in the dataset.

FIGURE 4: Recent fall history is the single strongest predictor of future fall risk.

WHAT THIS IMPLIES OPERATIONALLY

The 90-day period following any fall should be treated as an elevated-risk window, with monitoring sensitivity and workflows adjusted accordingly. Residents are often monitored the same way after a fall as they were before it.

MOBILITY AIDS

The walking-aid paradox.

Walking-aid users are 3.2× more likely to fall than residents who do not use mobility aids. They represent roughly one-third of the population but account for more than half of all falls.

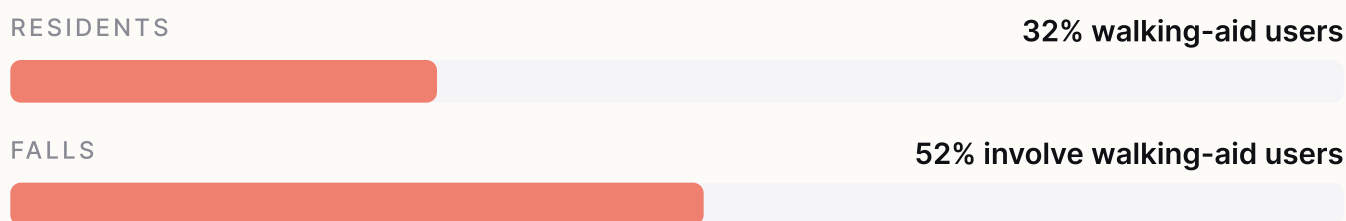
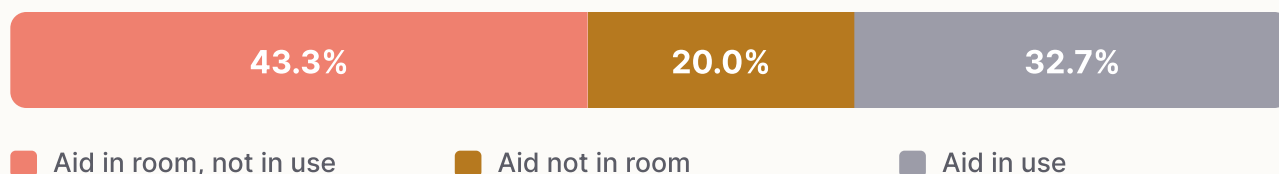


FIGURE 5: Walking-aid users are 32% of residents but 52% of falls.

WHERE THE AID IS DURING THE FALL



Two-thirds of walking-aid-user falls happen when the aid isn't being used. In 43% of cases, the aid is physically in the room but out of reach.

These falls are often preventable not through intervention, but through environmental adjustments: positioning walking aids within reach of the bed, reviewing room layouts, and ensuring staff reposition aids appropriately before lights-out.

COMPOUNDED RISK

Wheelchair users: a compounded risk.

Getting out of bed is already 2.5× more dangerous than baseline. For wheelchair users, that risk increases to 5.3× because the transfer itself introduces additional instability.

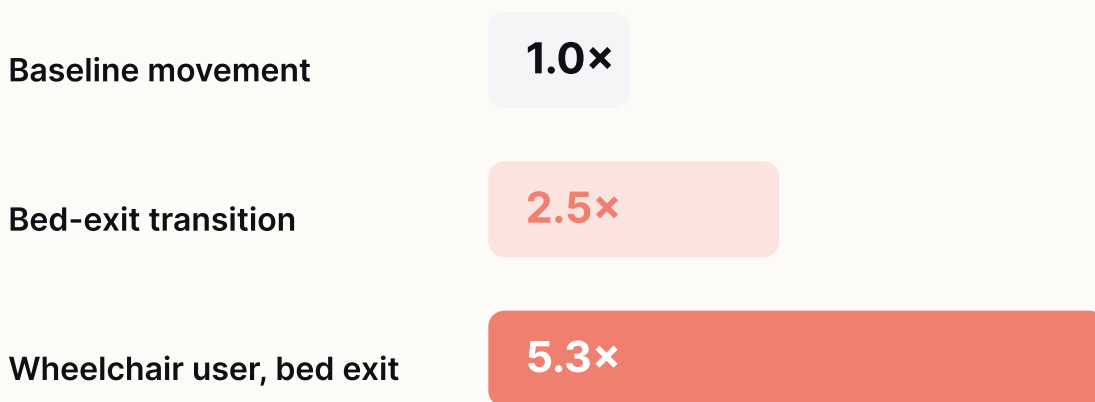


FIGURE 6: Wheelchair users face a compounded 5.3× fall risk on bed-to-wheelchair transfers.

TARGETED MONITORING · WHEELCHAIR USERS

–66%

Fall rate dropped from 16.8 to 5.7 per 1,000 patient-days - the largest population-level reduction in the dataset.

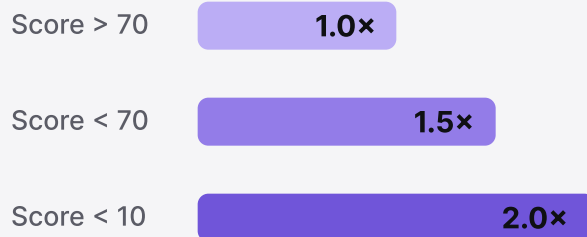
PASSIVE HEALTH SIGNALS

Sleep & respiration: the quiet signals.

Two passively collected health metrics showed meaningful correlations with fall risk even after controlling for other variables.

SLEEP REGULARITY · FIGURE 7

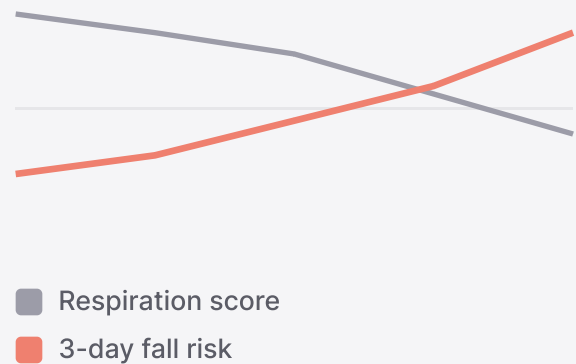
**Lower regularity →
higher fall rate.**



A 0–100 score that measures how consistently a resident falls asleep and wakes at the same time. Residents below 70 fall 1.5× more often; below 10, 2× more often. The relationship holds across both 3-day and 30-day prediction horizons.

RESPIRATION RATE · FIGURE 8

**Score drops →
3-day risk rises.**



When respiration rises above a resident's normal baseline, fall risk rises in the days that follow. Infection, fluid retention, and medication changes affect balance and often appear in breathing first.

Sleep regularity and respiration are early-warning signals. They appear days or weeks before a fall, while there is still time to intervene.

PART 03

Applying the findings.

Regardless of which monitoring system a community uses today, several operational changes consistently emerge as high-impact interventions.

01 The right alarms on the right residents.

Teton configures notifications per resident, per transition, per time of day, and per dwell time. When alarms fire on the transitions that actually carry elevated risk, three things happen: signal-to-noise improves, staff regain trust in alarms, and the residents at highest risk receive the most attention.

TRANSITION TYPE	FALL REDUCTION
Sitting in wheelchair → fall	–54.7%
Standing on floor → fall	–54.6%
Sitting on bed edge → fall	–53.4%

PER-RESIDENT NOTIFICATION CONFIG

Margaret S. · Room 12	Bed exit	Night only	> 1 hr dwell
Harold B. · Room 7	Wheelchair transfer	All hours	Any dwell

02 Reviewable fall clips.

When a fall does happen, Teton retains an anonymised clip of the minutes leading up to it. Teams review what happened and adjust environment, configuration, or workflow before the next fall occurs. Each reviewed incident makes the monitoring profile better tailored to the building.

03 Continuous health insights.

Sleep regularity, respiration, walking-speed trends, and stationarity should be captured passively, every night, for every monitored resident. These signals don't trigger alarms, they update each resident's longer-horizon risk profile, surfacing elevated-risk residents before falls occur.

Sleep regularity

64

↓ from 78 baseline

Respiration

+12%

above baseline

7-day fall risk

↑ 18%

elevated

PART 04

A different model of prevention.

WHAT MOST COMMUNITIES MISS

- 1 Most falls happen during transitions from support to instability, not corridor wandering.
- 2 The residents at highest risk are often residents communities already know are vulnerable.
- 3 Monitoring sensitivity is rarely adjusted after incidents, leaving the same gap open.

For decades, fall prevention has depended on retrospective assessment, periodic observation, and staff intuition. The 2,000 falls in this dataset suggest something different: falls cluster around identifiable transitions, predictable environmental conditions, repeated behavioural patterns, and measurable changes in resident stability, days before the event itself.

**Prevention becomes measurable
once the environment becomes observable.**

METHODOLOGY

Methodology, in brief.

Production data	853 residents across US, Danish, UK, and Swiss care communities, October 2025–March 2026.
Staff-confirmed	Fall labels are staff-confirmed events, not algorithmic guesses.
Held-out validation	Models validated on a held-out 20% of residents to ensure generalisation to new communities.
Community-level	The 42% reduction is measured at the community level, comparing pre- and post-deployment fall rates per 1,000 patient-days.
Decomposed	The 79% avoidable share is decomposed by failure mode and is reproducible from the dataset.

The full technical paper (Fall Prediction, Brack, April 2026) is available on request for leaders, regulators, and capital partners conducting due diligence.

WHAT TO DO NEXT

Five operational questions worth asking.

- 01** What is our current fall rate per 1,000 patient-days, and how does it trend by shift, unit, and mobility class?
- 02** After a fall, do we systematically increase monitoring sensitivity for the next 90 days?
- 03** Do alarms reach staff, every time, with low enough latency to act on?
- 04** For our walking-aid users, is the aid within reach at every bed and chair?
- 05** Do we know which of our residents fall in the top decile of 30-day risk this week?

If the answer to any of these is "we don't know" or "not consistently", that's the gap between your current fall rate and the 42% reduction Teton communities see.

Book a demo.

See what your fall data
actually looks like.

teton.ai/book-a-demo

All findings in this paper are based on production data from Teton-monitored care communities. Teton's monitoring system is not a medical device and does not diagnose, monitor, or direct clinical response to medical conditions. It supports and does not replace qualified care staff.