OneStep

WHITE PAPER · REAL-WORLD OUTCOMES

Longitudinal Outcomes of OneStep in Senior Living and Post-Acute Care

Falls, rehospitalizations, functional decline and cost avoidance across four deployments

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RE Longitudinal Outcomes of OneStep in Senior Living and Post-Acute Care

Where residents are measured routinely, fewer of them fall

Falls cost the US health system about $50 billion a year, and the organizations that house and treat older adults carry much of it as injury, hospitalization, liability and lost occupancy. This paper combines results from four closely monitored, clinically supervised deployments, in four settings and organizations, to ask what happens to falls, rehospitalizations and function when residents' walking is measured routinely, and what that is worth.

4
Settings and organizations: skilled nursing, contract therapy, senior living, community

19–26%
Fewer falls where measurement was most frequent

9.3%
Fewer rehospitalizations at higher-screening facilities

$0.6–1.3M
Modeled annual cost avoidance per 1,000 residents

Each deployment was measured against the organization's own prior period, with internal comparison groups and clinical oversight throughout, so the standards behind these numbers are high. The pattern that repeats across settings is a dose–response: the more consistently residents were measured, the larger the reduction in falls. Facilities that measured residents every two weeks cut falls by 19%; facilities that measured monthly by 13%; where measurement lapsed, falls rose in step with control facilities that never deployed. Where screening was highest, rehospitalizations fell too, and where measurement was paired with digital exercise, 87–95% of participants held or improved function.

For operators

Fewer falls means fewer injuries, fewer hospital transfers, and an objective record that the fall program works.

For therapy providers

Decline is caught between screenings, residents return to skilled therapy before the fall, and documentation is grounded in objective data.

For risk-bearing organizations

Each avoided fall and readmission is cost the ACO, plan or episode does not carry, and rehospitalization is a measure CMS and payers already track.

WHAT THIS PAPER IS, AND IS NOT

These are real-world, pre–post results from supervised deployments with internal comparison groups rather than randomized controls. They do not prove causation. They do show a consistent, dose-dependent association between measurement and outcomes across very different settings, and they quantify what that association is worth if it holds.

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Longitudinal Outcomes of OneStep in Senior Living and Post-Acute Care

A multi-site real-world analysis of falls, rehospitalizations, functional decline and cost avoidance

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ABSTRACT

Background. Falls are the leading cause of injury among adults aged 65 and older, with medical costs of roughly $50 billion a year in the United States, and are a principal driver of hospital transfers from senior living and skilled nursing. Fall-risk assessment in these settings is typically episodic and subjective, so functional decline between assessments goes unmeasured.

Objective. To consolidate longitudinal outcomes from deployments of OneStep, a smartphone-based gait analysis and monitoring platform, and to estimate the associated cost avoidance.

Methods. Retrospective analysis of four deployments: a skilled-nursing operator (29 facilities, 5 non-deploying controls; falls one year after deployment versus the prior year, stratified by measurement cadence), a contract-therapy provider across skilled nursing and long-term care (falls and rehospitalizations, prior versus current year, stratified by screening intensity), a senior-living organization (525 residents assessed at least twice over six months) and a community program for older adults living at home (about 500 members over six months). Outcomes were falls, 30-day rehospitalizations and functional change; cost avoidance was modeled from published unit costs.

Results. In the skilled-nursing operator, falls fell 19% where most residents were measured every two weeks (13 facilities), 13% where measured monthly (7), and rose 4% where measurement lapsed (9) versus +3% in controls; five later-deploying facilities, all bi-weekly, reduced falls by 13–25%. In the contract-therapy network, the share of residents who fell declined from 22.5% to 18.5% at higher-screening facilities (–17.8%) and rose from 16.2% to 18.0% where screening was low; rehospitalizations at higher-screening facilities fell from 18.3% to 16.6% (–9.3%). In senior living, 86.7% of residents maintained or improved function and an estimated 35 falls were avoided in six months (15% reduction). In the community program, 95% of members held or improved function versus a 77.5% benchmark, with a tenfold difference in improvement between the most and least active quartiles. Modeled avoidance was $0.3–1.0 million per 1,000 residents per year from falls and about $0.3 million from rehospitalizations.

Conclusions. Across four settings, routine objective gait measurement was associated with fewer falls, fewer rehospitalizations and preserved function, with the size of the effect tracking the intensity of measurement. The designs are observational; the consistency and dose dependence of the association support prospective controlled evaluation.

KEY POINTS

Question	What happens to falls, rehospitalizations and function when older adults' gait is measured routinely with a smartphone, and what is that worth?
Findings	Across four deployments, falls fell 19% where residents were measured every two weeks and 18% where screening was highest, and rose where measurement lapsed; rehospitalizations fell 9.3% at higher-screening facilities; 87–95% of participants maintained or improved function. Modeled cost avoidance was $0.6–1.3 million per 1,000 residents per year.
Meaning	The association between measurement and outcomes is consistent across settings and dose-dependent, which is what a causal effect would look like; a prospective controlled study is the next step.

KEYWORDS falls · fall prevention · gait analysis · remote monitoring · skilled nursing · senior living · rehospitalization · value-based care · cost avoidance

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1 Introduction

More than one in four adults aged 65 and older report falling each year, over 14 million people, and about 37% of those falls cause an injury that requires medical treatment or restricts activity.[1] Falls are the leading cause of injury-related death in this age group, with over 41,000 deaths in 2023, and the number has risen sharply over the past decade.[1,2] The medical cost of fatal and non-fatal falls in older adults was estimated at $50 billion in 2015, of which Medicare paid about $29 billion.[3] A hospitalization for a fall injury costs on the order of $30,000.[4]

The burden is concentrated in the settings that care for frail older adults. In nursing homes, residents fall at roughly 1.5 falls per bed per year, and about half of residents fall annually.[5] Falls drive transfers to the emergency department and hospital readmissions, and rehospitalization is itself a quality measure: skilled nursing facilities have 2% of Medicare Part A payments at stake under the SNF Value-Based Purchasing program,[6] and payers, accountable care organizations and episode-based models hold providers accountable for the same events. The average 30-day readmission costs about $18,100 for Medicare beneficiaries.[7]

Fall-risk assessment in these settings is usually episodic (at admission and quarterly) and relies on clinician impression or brief functional tests. Between assessments, gait can deteriorate for weeks without being measured. Gait speed and related parameters are among the strongest predictors of falls, hospitalization, loss of independence and mortality,[8,9] and a change of as little as 0.1 m/s is clinically meaningful.[10] Exercise programs that improve balance and function reduce the rate of falls by about 23% in community-dwelling older adults.[11] The missing element has been a practical way to measure gait continuously, at scale, in the places where older adults live and receive care.

OneStep measures gait from a standard smartphone carried in the pocket, with validity established against laboratory systems in peer-reviewed studies,[12–14] and converts the measurements into a fall-risk level that stratifies residents by time to first fall.[15] This paper consolidates longitudinal outcomes from four deployments in which the platform was used to identify declining residents and act, and estimates the cost avoidance associated with the observed changes.

2 The intervention

Deployments differ in detail between skilled nursing, contract therapy, senior living and community programs, but all follow the same four-step loop (Figure 1). **Measure:** residents walk with a phone in the pocket; a one-minute walk yields gait speed, double support, asymmetry and 30 further parameters, with passive measurement of everyday walking where enabled. **Assess:** each resident is placed on a validated 0–100 fall-risk score and tracked against their own baseline, and the roster surfaces who is declining. **Act within care:** when risk rises, the care team is alerted and the resident is referred into or back to skilled therapy, reassessed, or managed through medication review or environmental changes. **Act outside care:** stable residents receive digital wellness recommendations, a home exercise program and feedback on their own Walk Score, which sustains engagement and function between episodes of care. Documentation is generated from the objective data and carried into the EMR.

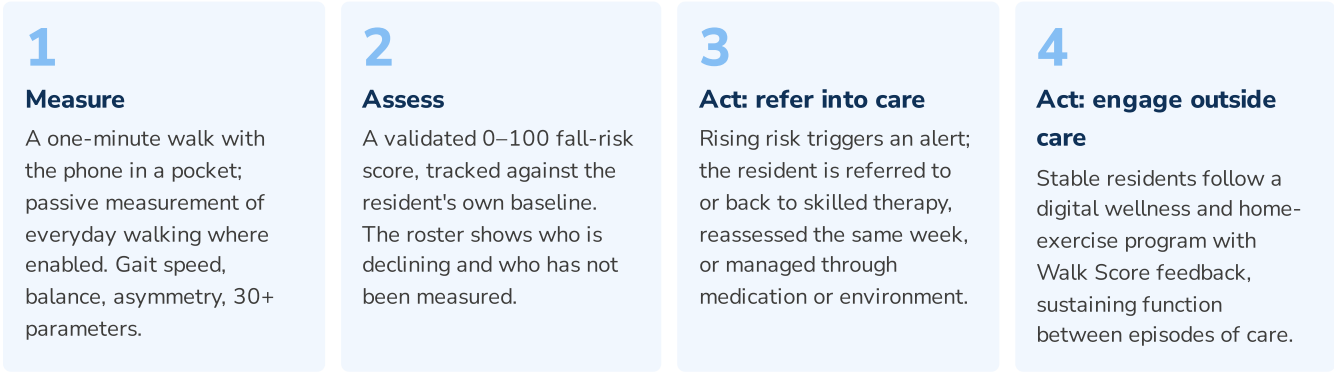


Figure 1. The monitoring loop common to all deployments. Steps 3 and 4 are the two forms of action: referral into or out of care when risk changes, and digital engagement when a resident is stable.

3 Methods

3.1 Design

This is a retrospective, multi-site analysis of operational outcome data from four organizations that deployed OneStep between 2024 and 2026 (Table 1). Each organization compared outcomes after deployment with its own prior period, and three of the four provided an internal comparison: facilities that did not deploy, facilities where measurement lapsed, or participants grouped by measurement or exercise intensity. No site was randomized and clinicians were not blinded; the analysis is correlational.

3.2 Sites

Site A is a skilled nursing and rehabilitation operator with 29 facilities using OneStep and 5 facilities that had not deployed, used as controls. Falls per facility in the year after deployment were compared with the year before and stratified by how consistently residents were measured: bi-weekly (most residents measured every two weeks), monthly, or lapsed (at least half of residents not measured on a cadence). Five facilities that deployed later were analyzed separately one year after their deployment.

Site B is a family-owned contract therapy provider operating across skilled nursing, long-term care, restorative nursing and memory care in 10 states. It implemented a three-tier model: measurement at admission, passive monitoring by restorative nursing assistants, and same-week reassessment and therapy referral when risk rose. Each facility was compared with its own prior year; facilities were grouped by OneStep screening intensity. Outcomes were the percentage of residents who fell and the percentage rehospitalized.

Site C is a large US senior-living organization (independent living, assisted living and skilled nursing) that introduced OneStep in mid-2025 as a shared platform between ownership and its in-house therapy provider. Over six months, 525 residents were assessed at least twice (4,397 assessments); 253 residents were flagged high or very high risk. Outcomes were functional change and falls avoided, the latter estimated against the expected six-month fall incidence of 15–20% in older adults.[1]

Site D is a six-month program run by a social-welfare network for older adults living at home, with about 500 members; 374 were fully onboarded with a Walk Score and 266 exercised. Members recorded walks, completed questionnaires and followed a home exercise program in the application; 84% of members with motion-sensor phones were monitored passively. Outcomes were functional change and exercise adherence, with members grouped into quartiles of exercise days.

Table 1. Deployments included in the analysis.

Site	Setting	Scale	Comparison	Period	Outcomes
A	Skilled nursing and rehabilitation operator	29 facilities + 5 controls	Prior year; controls; measurement cadence	1 year post-deployment	Falls per facility
B	Contract therapy; SNF, LTC, restorative, memory care	Network in 10 states	Prior year; screening intensity	1 year	% residents falling; % rehospitalized
C	Senior living (IL, AL, SNF)	525 residents; 4,397 assessments	Pre-deployment function; expected fall incidence	6 months	Function; falls avoided; documentation time
D	Community-dwelling older adults	~500 members; 374 onboarded	Senior-living benchmark; exercise quartiles	6 months	Function; adherence

3.3 Outcome definitions

Falls were taken from each organization's incident reporting. Site A reported total falls per facility; Site B reported the percentage of residents with at least one fall. Rehospitalization (Site B) was the percentage of residents readmitted to hospital. Functional change (Sites C and D) was classified as improved, maintained or declined from the resident's gait parameters and Walk Score over the program; the comparison benchmark of 77.5% maintained or improved per quarter is OneStep's observed average for senior-living communities without the platform.

3.4 Cost model

Cost avoidance was estimated per 1,000 residents per year by multiplying the observed change in event rates by published unit costs: $7,500 per fall as a conservative blended cost across falls with and without medical treatment (the assumption used by Site C),

$14,000 per injurious fall, and $18,100 per Medicare 30-day readmission.[7] For Site A, where falls were reported as a percentage change, the baseline rate of 22.5% of residents falling observed at Site B was applied. Estimates are illustrative and exclude indirect costs such as staff time, liability and lost occupancy.

4 Results

4.1 Falls and measurement cadence (Site A)

One year after deployment, the change in falls tracked how consistently each building measured its residents (Figure 2). In the 13 facilities where most residents were measured every two weeks, falls fell by 19%; in the 7 measuring monthly, by 13%. In the 9 facilities where measurement lapsed, falls rose by 4%, almost exactly the +3% seen in the 5 control facilities. Across all 29 facilities, including those where use lapsed, falls fell 8–9%. The five facilities that deployed later all measured bi-weekly and all reduced falls, by 25%, 23%, 22%, 17% and 13%.

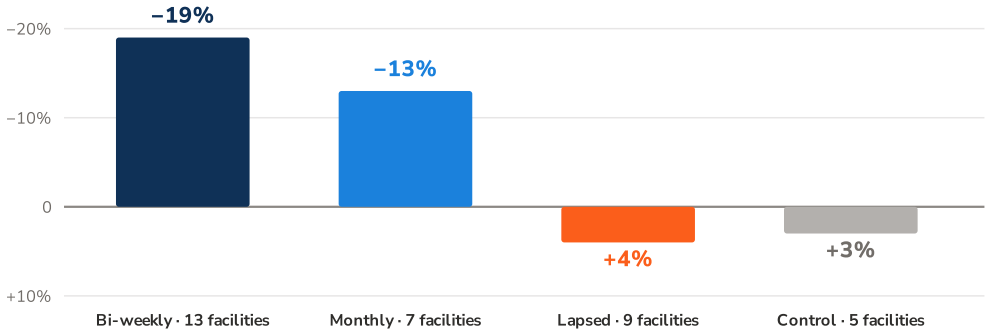


Figure 2. Change in falls one year after deployment, by measurement cadence (Site A). Mean change per group versus each facility's prior year. Bi-weekly: most residents measured every two weeks; monthly: most measured once a month; lapsed: at least half of residents not measured on a cadence; control: no deployment.

4.2 Falls, rehospitalizations and screening intensity (Site B)

At facilities with higher OneStep screening, the share of residents who fell declined from 22.5% to 18.5% (−17.8%); at facilities with low screening it rose from 16.2% to 18.0% (+11.1%) (Figure 3A). Relative to the trend where screening was low, high-screening facilities had 26% fewer falls (0.822 ÷ 1.111 = 0.74). At the higher-screening facilities, rehospitalizations declined from 18.3% to 16.6% of residents (−9.3%), a 1.7-point reduction equivalent to about 17 fewer rehospitalizations per 1,000 residents (Figure 3B).

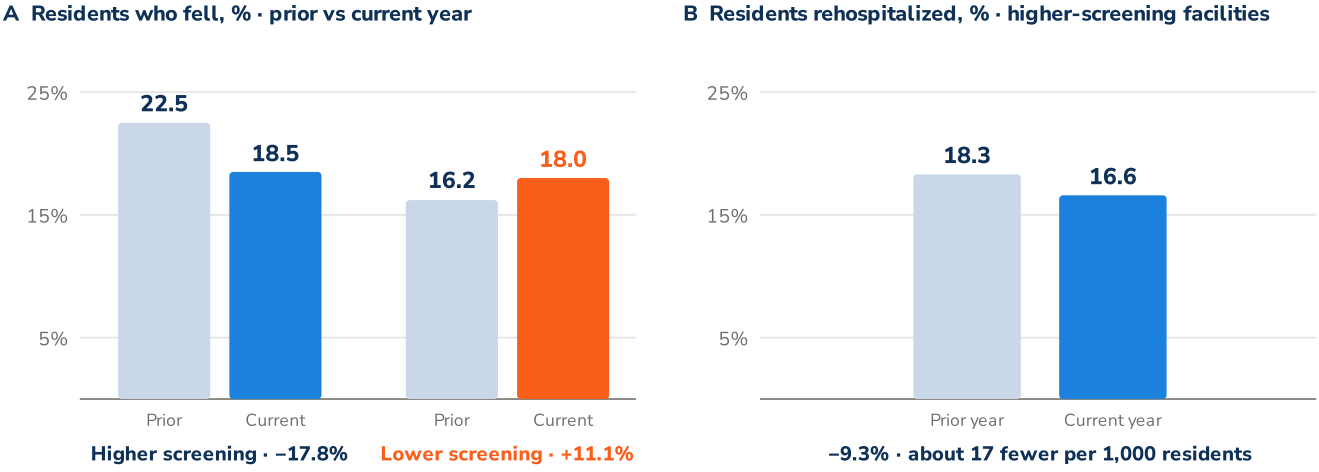


Figure 3. Falls and rehospitalizations by screening intensity (Site B). Each facility compared with its own prior year. A: percentage of residents who fell. B: percentage rehospitalized at higher-screening facilities.

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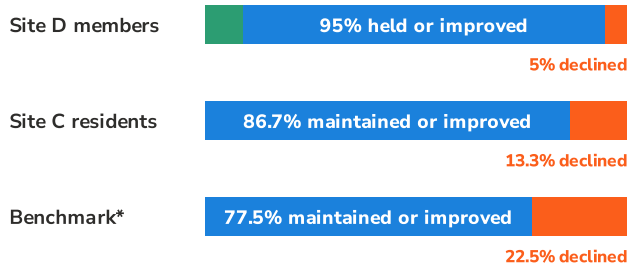
4.3 Function and falls in senior living (Site C)

Of 525 residents assessed at least twice over six months, 86.7% maintained or improved functional mobility, twice the improvement observed before OneStep. The platform identified 236 residents as high or very high risk early; 105 residents (20%) were judged significantly less likely to fall or be injured following intervention. Against an expected six-month fall incidence of 15–20% in older adults,[1] an estimated 35 falls were avoided among the 253 flagged residents (a 15% reduction, described by the organization as a minimum). Automated documentation saved about 1,650 minutes per location, and remote therapeutic monitoring generated $4,206 in revenue in six months.

4.4 Function and engagement in the community (Site D)

Over six months, 86% of members maintained function and 9% improved; 5% declined, compared with 20–25% typically declining per quarter in US senior living (Figure 4A). Members who exercised completed an average of 24 full exercise days, about 8 per month, against 1–3 for typical digital programs and about 4 for in-person therapy. Improvement was dose-dependent: the most active quartile of members improved at ten times the rate of the least active (20% vs 2%; Figure 4B).

A Functional change over the program, % of participants



B Improvement rate by exercise quartile (Site D, 46 members each)

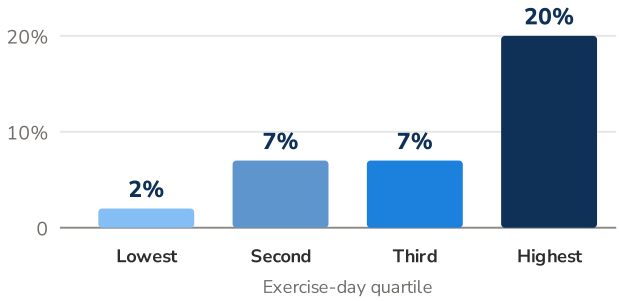


Figure 4. Function and engagement. A: share of participants who held or improved function at Sites D and C against the benchmark. *OneStep's observed quarterly average for senior-living communities without the platform. B: share of Site D members whose function improved, by quartile of exercise days.

4.5 Summary of outcomes

Table 2 brings the outcomes together. In every site with an intensity gradient, the group measured or exercising most had the best outcome, and in both sites with a low-intensity group, that group moved in the wrong direction.

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Table 2. Outcomes by site and intensity of measurement or engagement.

Site	Group	Falls	Rehospitalization	Function
A	Bi-weekly measurement (13)	−19% (later cohort: −13 to −25%)	—	—
	Monthly measurement (7)	−13%	—	—
	Measurement lapsed (9)	+4%	—	—
	Control, no deployment (5)	+3%	—	—
B	Higher screening	22.5% → 18.5% of residents (−17.8%)	18.3% → 16.6% (−9.3%)	—
	Lower screening	16.2% → 18.0% (+11.1%)	—	—
C	525 residents, 6 months	35 avoided (−15%, minimum)	—	86.7% maintained or improved
D	~500 members, 6 months	—	—	95% held or improved; 5% declined
	Highest vs lowest exercise quartile	—	—	20% vs 2% improved

4.6 Modeled cost avoidance

Table 3 translates the observed changes into cost per 1,000 residents per year. Applying Site B's observed reduction (40 fewer residents falling per 1,000) at $7,500 per fall yields about $300,000; Site A's bi-weekly reduction applied to the same baseline yields about $320,000; Site C's 35 falls avoided per 525 residents in six months annualizes to about 133 falls per 1,000, or $1.0 million. At $14,000 per injurious fall the fall-related figures rise proportionally. Site B's 17 fewer rehospitalizations per 1,000 at $18,100 each adds about $308,000. Combining fall and rehospitalization avoidance gives a range of roughly $0.6–1.3 million per 1,000 residents per year, before indirect costs. These figures are consistent with OneStep's standing model of $400,000–700,000 from a 25% fall reduction and $250,000–500,000 from a 10% readmission reduction per 1,000 monitored patients.

Table 3. Modeled cost avoidance per 1,000 residents per year. Illustrative; excludes staff time, liability, lost occupancy and quality-program payments.

Source of avoidance	Basis	Events avoided	Unit cost	Avoidance
Falls, Site B higher screening	22.5% → 18.5% of residents falling	40	$7,500	$300,000
Falls, Site A bi-weekly	−19% applied to 22.5% baseline	43	$7,500	$320,000
Falls, Site C	35 avoided / 525 residents / 6 months	133	$7,500	$1,000,000
Falls, injurious-fall cost	Site B reduction at injurious-fall cost	40	$14,000	$560,000
Rehospitalizations, Site B	18.3% → 16.6% of residents	17	$18,100	$308,000
Combined range	Falls (Site B or A) + rehospitalizations, to Site C + rehospitalizations			**$0.6–1.3M**

5 Discussion

Four deployments in four different care settings show the same pattern: where residents' gait was measured routinely, falls declined, rehospitalizations declined where measured, and function was preserved; where measurement lapsed or screening was low, outcomes moved the other way, in step with facilities that never deployed. The reductions in the most consistently measured groups (19% at Site A, 17.8% at Site B against their own prior years, 26% relative to low-screening facilities) are similar to the 23% reduction in fall rate that exercise programs achieve in randomized trials,[11] which is notable because measurement is not

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itself an intervention. Its effect runs through what it triggers: earlier referral to therapy, reassessment, medication and environmental review, and sustained engagement with exercise.

The dose–response is the strongest feature of the evidence. At Site A the gradient ran across four groups, from bi-weekly through monthly to lapsed and control; at Site B across screening intensity; at Site D across exercise quartiles. A gradient of this kind is harder to explain by selection alone than a simple before–after difference, and it has a direct operational implication: the organizations in this analysis have since set bi-weekly measurement as the standard for every building. It also matches the biology. Decline before a fall typically emerges 10–14 days earlier as a change in gait speed or asymmetry;[15] a quarterly screen cannot see it, a monthly one may, and a bi-weekly cadence catches most of it.

Rehospitalization is the outcome that most directly concerns risk-bearing organizations, and it moved in the expected direction where it was measured. Falls are a leading cause of transfer from post-acute care, so fewer falls should produce fewer transfers; the 9.3% reduction observed at Site B is consistent with that mechanism, and at about $18,100 per readmission it is also the component of cost avoidance that payers and CMS already track.[6,7]

The cost estimates are deliberately conservative. They use a blended cost per fall well below the cost of a fall hospitalization,[4] exclude emergency-department visits without admission, and omit indirect costs that operators bear: staff time for incident response and documentation, liability, regulatory exposure, and the lost occupancy that follows a resident's hospitalization or move to a higher level of care. Site C's documentation savings of about 1,650 minutes per location, and the remote therapeutic monitoring revenue it generated, illustrate value outside the model.

5.1 Limitations

These are observational, pre–post analyses of operational data, and they cannot establish causation. Facilities and residents were not randomized, and the intensity groups were self-selected: a facility that measures residents every two weeks may differ in leadership, staffing and culture from one where measurement lapsed, and those differences may themselves affect falls. Secular trends and changes in fall reporting after deployment cannot be excluded, although the control facilities at Site A, which rose by 3%, argue against a general downward trend. Functional-change benchmarks derive from OneStep's own observational data rather than external norms. Cost avoidance rests on published unit costs applied to observed rate changes and should be read as illustrative. Finally, the four sites differ in setting, population and outcome definition, so results are presented side by side rather than pooled.

5.2 Future work

The consistency and dose dependence of these findings justify a prospective, controlled evaluation: facilities within a single operator randomized to bi-weekly measurement or usual screening, with falls, injurious falls, hospital transfers and 30-day readmissions as pre-specified outcomes and fall-risk levels concealed from clinicians at control sites. Such a design would also allow the independent contribution of each step of the loop, measurement, referral and digital engagement, to be estimated.

6 Conclusion

Across skilled nursing, contract therapy, senior living and community care, routine smartphone-based gait measurement was associated with 19% fewer falls where residents were measured every two weeks (18% where screening was highest), 9.3% fewer rehospitalizations where screening was highest, and preserved function in 87–95% of participants, with the size of the effect tracking the intensity of measurement and engagement. Modeled avoidance of $0.6–1.3 million per 1,000 residents per year, before indirect costs, indicates that the economic case rests on the same mechanism as the clinical one: seeing decline in time to act.

References

1. Centers for Disease Control and Prevention. Older adult falls data. Atlanta, GA: CDC; 2025. Available at cdc.gov/falls/data-research.
2. Kakara R, Bergen G, Burns E, Stevens M. Nonfatal and fatal falls among adults aged ≥65 years, United States, 2020–2021. *MMWR Morb Mortal Wkly Rep.* 2023;72:938–943.
3. Florence CS, Bergen G, Atherly A, Burns E, Stevens J, Drake C. Medical costs of fatal and nonfatal falls in older adults. *J Am Geriatr Soc.* 2018;66(4):693–698.
4. Burns ER, Stevens JA, Lee R. The direct costs of fatal and non-fatal falls among older adults, United States. *J Safety Res.* 2016;58:99–103.

5. Rubenstein LZ, Josephson KR, Robbins AS. Falls in the nursing home. *Ann Intern Med.* 1994;121(6):442–451.
6. Centers for Medicare & Medicaid Services. Skilled Nursing Facility Value-Based Purchasing Program: FY 2026 fact sheet. Baltimore, MD: CMS; 2025.
7. Agency for Healthcare Research and Quality. Clinical conditions with frequent, costly hospital readmissions by payer, 2020. HCUP Statistical Brief #307. Rockville, MD: AHRQ; 2024.
8. Studenski S, Perera S, Patel K, et al. Gait speed and survival in older adults. *JAMA.* 2011;305(1):50–58.
9. Verghese J, Holtzer R, Lipton RB, Wang C. Quantitative gait markers and incident fall risk in older adults. *J Gerontol A Biol Sci Med Sci.* 2009;64(8):896–901.
10. Perera S, Mody SH, Woodman RC, Studenski SA. Meaningful change and responsiveness in common physical performance measures in older adults. *J Am Geriatr Soc.* 2006;54(5):743–749.
11. Sherrington C, Fairhall N, Wallbank G, et al. Exercise for preventing falls in older people living in the community: an abridged Cochrane systematic review. *Br J Sports Med.* 2020;54(15):885–891.
12. Shahar RT, Agmon M. Gait analysis using accelerometry data from a single smartphone: agreement and consistency between a smartphone application and gold-standard gait analysis system. *Sensors.* 2021;21:7497.
13. Christensen JC, Stanley EC, Oro EG, et al. The validity and reliability of the OneStep smartphone application under various gait conditions in healthy adults with feasibility in clinical practice. *J Orthop Surg Res.* 2022;17:417.
14. Contreras C, Stanley EC, Deschamps-Prescott C, et al. Evaluation of smartphone technology on spatiotemporal gait in older and diseased adult populations. *Sensors.* 2024;24(17):5839.
15. OneStep Research Team. Clinical validation of the OneStep Fall Risk Assessment. OneStep White Paper; September 2026. Available at onestep.co/resources.
16. OneStep. Where residents were measured every two weeks, falls fell 19%: Rockport Healthcare Services customer story. 2025. Available at onestep.co/customer-stories.
17. OneStep. Where Signature Rehab screened more, rehospitalizations fell 9.3%: customer story. 2026. Available at onestep.co/customer-stories.
18. OneStep. How a digital home exercise program tied to functional mobility helped 95% of older adults hold or improve function: JDC customer story. 2026. Available at onestep.co/customer-stories.

Site identification. Sites A, B and D correspond to the published customer stories in references 16–18 (Rockport Healthcare Services, Signature Rehab and JDC); Site C is a US senior-living organization that has asked not to be named. **Suggested citation.** OneStep Research Team. Longitudinal outcomes of OneStep in senior living and post-acute care. OneStep White Paper; October 2026. Available at onestep.co/resources.

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