

From Engagement to Impact: How Digital Mobility Monitoring Drives Gait Speed Improvement and Reduces Fall Risk

Abstract

In the transition to value-based care, gait speed has emerged as a critical "sixth vital sign" that predicts hospitalization, functional independence, and total cost of care. This paper presents real-world evidence from 2023–2025 across multiple healthcare organizations, demonstrating a clear correlation between patient engagement with the OneStep platform and meaningful clinical improvement in gait speed. Our findings suggest that increasing digital engagement is not merely an operational goal but a primary clinical strategy for improving mobility and reducing risk.

The Clinical Stakes: Why Gait Speed?

Gait speed is one of the most powerful indicators of health in older adults. Scientific literature consistently shows that even modest improvements in gait velocity (e.g., 0.10 m/s) are associated with:

- Reduced mortality risk
- Lower incidence of falls
- Decreased hospitalization and healthcare utilization

Because of its strong relationship to clinical outcomes and cost, gait speed is increasingly used to inform care planning, risk stratification, and value-based decision-making. This analysis addresses a critical question: Does greater engagement with digital mobility monitoring translate into measurable functional improvement in gait speed?

Methodology: A Rigorous Approach to Real-World Data

We conducted a retrospective analysis of mobility data collected through the OneStep platform between 2023 and 2025. To ensure clinical relevance and minimize noise, we implemented a conservative baseline eligibility framework designed to reflect real-world care delivery rather than idealized trial conditions.

1. Patient-Level Validation

Patient-quarters were included only if they met the following criteria:

- Minimum Span (per patient, within-quarter): At least 14 days between first and last measurement to ensure we captured longitudinal change rather than daily fluctuation
- Assessment Density: A minimum of ≥ 2 validated assessments within the quarter.

2. Organizational Integrity

To ensure stability and generalizability, organizations were included only if they met all of the following:

- ≥ 10 active patients per month of a quarter
- Full three-month quarter completeness
- At least three qualifying quarters meeting the above criteria

3. Metric Definitions

- Adoption (Input): Engagement with OneStep was measured as average measurements per patient per quarter, representing the volume of sustained patient interaction with the platform.
- Clinical outcome (Output): Gait speed improvement was calculated as the rate of change per month.
Positive values indicate improvement.

4. Statistical Analysis

Associations between engagement volume and gait speed improvement were assessed at the organization-quarter level using descriptive trend analysis and organization-specific patterns.

Results: The "Engagement Effect"

Across 51 organization-quarters from six healthcare organizations, organization-specific trends indicate that higher engagement with the OneStep platform was associated with greater gait speed improvement rates per month.

Organization-quarters with higher engagement volume demonstrated visibly greater rates of gait speed improvement. Consistent improvement trends observed across multiple organizations with differing patient populations, baseline performance levels, and clinical settings.

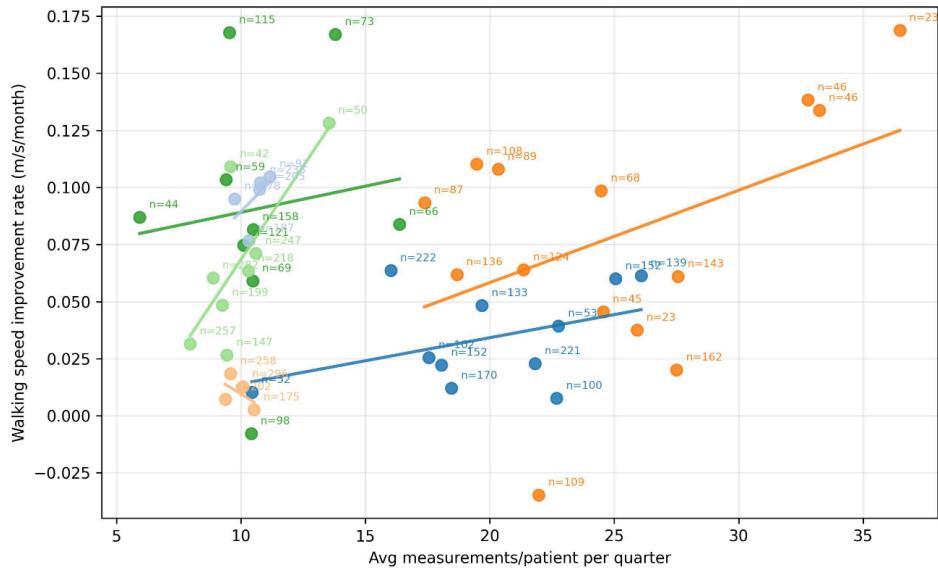


Figure 1: Quarterly Patient Engagement and Gait Speed Improvement Across Organizations. Each dot represents an organization-quarter ($n=$ indicates the number of patients contributing data to that point). Engagement is measured as average # of measurements per patient per quarter, and outcome is average gait speed improvement rate per quarter. Colors represent different organizations. Organization-specific trend lines illustrate within-organization associations between engagement and gait speed improvement.

Discussion & Economic Impact

Gait speed is a foundational measure of mobility, independence, and fall risk. The magnitude of improvement observed in higher-engagement OneStep quarters aligns closely with thresholds known to be associated with improved clinical outcomes.

These findings suggest that sustained engagement with digital mobility monitoring may amplify the effectiveness of existing clinical care by:

- Reinforcing patient accountability through regular measurement and feedback
- Providing clinicians with longitudinal visibility into mobility trends
- Enabling earlier identification of stalled or declining progress

In this context, digital engagement is not passive data collection, it becomes an active component of functional recovery.

The Value of a Fall Prevented

Falls are among the highest drivers of uncompensated costs in post-acute care and senior living. By driving gait speed improvements through engagement, organizations can transition from reactive treatment to proactive risk management.

Improved gait speed = Lower Fall Risk = Significant Reductions in Emergency Department visits and Hospitalizations.

Digital tools that promote consistent engagement and functional improvement may therefore play an important role in value-based care strategies.

Strategic Takeaway

OneStep transforms engagement into impact. Organizations that maximize platform use are not simply collecting data - they are enabling faster functional recovery and supporting a lower-risk patient population.

Limitations

This analysis has several limitations:

- Observational study design
- Quarter-level aggregation rather than patient-level causal modeling
- Potential confounding factors such as therapy intensity or case mix

However, the consistency of findings across organizations, the conservative eligibility criteria, and the strong alignment with established mobility science strengthen confidence in the results.