

# TRAZER SENIOR CARE FALLS PREVENTION OUTCOMES

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## TRAZER®-BASED SOLUTIONS

This overview provides the background to assist rehabilitation professionals in evaluating how TRAZER technology can be used to enhance patient care and expand their business opportunities.

### BACKGROUND

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Falls, with or without injury, carry a heavy quality of life impact on seniors over age 65. According to the U.S. Centers for Disease Control and Prevention; one in four Americans aged 65+ falls each year. Every 11 seconds, an older adult is treated in the emergency room for a fall; every 19 minutes, an older adult dies from a fall.

Falls result in more than 2.8 million injuries treated in emergency departments annually, including over 800,000 hospitalizations and more than 27,000 deaths. In 2015, the total cost of fall injuries was \$50 billion. Medicare and Medicaid shouldered 75% of these costs.

The financial toll for older adult falls is expected to increase as the population ages and may reach \$67.7 billion by 2020. A growing number of older adults fear falling and, as a result, limit their activities and social engagements. This can result in further physical decline, depression, social isolation, and feelings of helplessness.

### TRAZER INTERVENTION - LAS-90 TEST

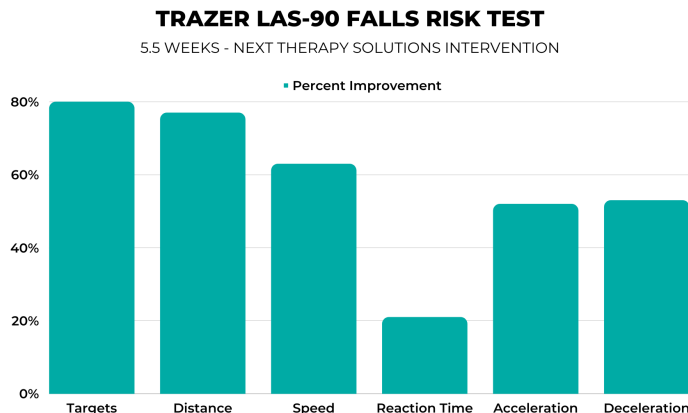
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In 2018 – 2019, NEXT Therapy Solution's Senior Care Division utilized TRAZER Technology in 25 Senior Living Communities as the core of their fall prevention and treatment protocol. The therapists tracked performance metrics and outcomes over a 5.5-week period of time.

Multiple TRAZER Assessments were used for this study, with the goal of reducing falls. TRAZER's Lateral Agility Screen (LAS 90) served as one standard. This assessment requires a lateral shuffle to randomized left/right targets and is a timed, 90-second evaluation. The Lateral Shuffle movement isolates Left/Right performance metrics that asymmetrical imbalances can be easily detected. Baseline assessments for 65 Senior Residents showed an average gait speed of 0.89 feet per second.

**Over the 5.5 weeks of Therapy Intervention, averages achieved by the residents in the Study were:**

- 80% increase in targets achieved
- 77% increase in distance covered
- 63% increase in gait speed
- 21% faster reaction time
- 52% increase in acceleration
- 34% reduction in falls
- 53% improvement in deceleration



**TRAZER INTERVENTION - RAS-90 TEST**

TRAZER's Random Agility Screen (RAS 90) was also used in the study. This 90-second assessment requires randomized transit to 9 different points in multiple angles on the TRAZER field. A baseline assessment of 47 residents showed an average gait speed of 1.10 feet per second. Serial testing was performed on 47 residents who entered the 5.7 weeks of Therapy Intervention with an average gait speed of 1.10 feet per second.

A total of 420 tests were administered to track progress and outcomes achieved. The following Table, from page 39 of the American College of Sports Medicine's "Exercise Management for Persons with Chronic Diseases", provides cutoffs for walking speed to minimize risk and is in line with the CDC's recommendation for intervention to reduce risk of falling.

Walking Speed (ft/sec)							
0	0.65	1.31	1.97	2.62	3.28	3.94	4.59
Dependent in ADLs and IADLs				Independent in ADLs			
More likely to be hospitalized				Less likely to be hospitalized			
Needs intervention to reduce fall risk						Less likely to fall	
Household ambulator		Limited Community Ambulator		Community Ambulator		Cross Street	

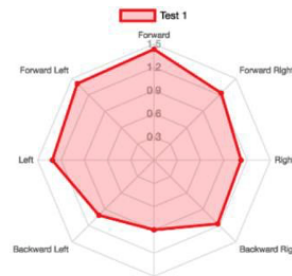
The following graph illustrates the data that is reported by the TRAZER system. The subject is a 77-year-old female. You can see here that the subject's Forward Speed is at 1.437 feet per second, which is less than half the CDC's guideline. Additionally, she is showing a 14.64% faster speed to the left than to the right.

Statistically, an 8 – 10% asymmetrical movement pattern is attributed to right handedness or left- handedness. It could also be due to “training effect” in an athlete. If the % of imbalance is more than 10%, particularly in combination with a very slow movement speed, the subject’s mobility impairment may have a modifiable cause and would warrant exploration by the therapist and possible exercise or therapy interventions..

The questions to ask could include:

- Is there a visual impairment?
- Is the subject well-hydrated?
- Could there be a pharmacological problem?
- Is there an orthopedic issue – as simple as a stubbed toe?
- Do they have a UTI, or have they suffered a TIA?

**Speed**

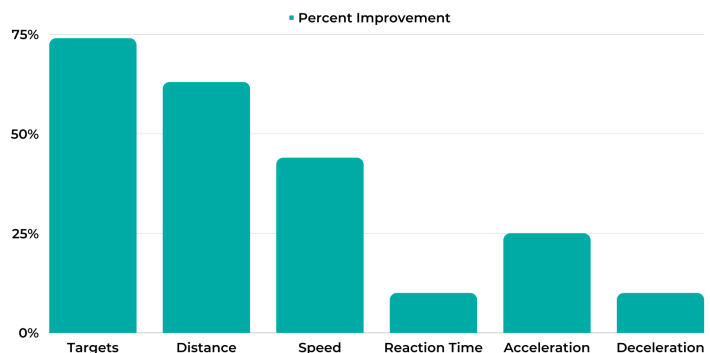


Speed (ft/s)	Test 1
Forward	1.4370
ForwardRight	1.2333
Right	1.1175
BackwardRight	1.1588
Backward	0.9009
BackwardLeft	1.0003
Left	1.3091
ForwardLeft	1.3934
L/R Difference	14.64 % L

**Data from 74 residents of Memory Care / Assisted Living facilities in Tampa, Florida showed the following improvements:**

- 74% increase in targets achieved
- 63% increase in distance covered
- 44% increase in gait speed
- 10% faster reaction time
- 25% increase in acceleration
- 10% improvement in deceleration

**TRAZER RAS-90 FALLS RISK TEST**  
5.7 WEEKS POST - NEXT THERAPY SOLUTIONS INTERVENTION

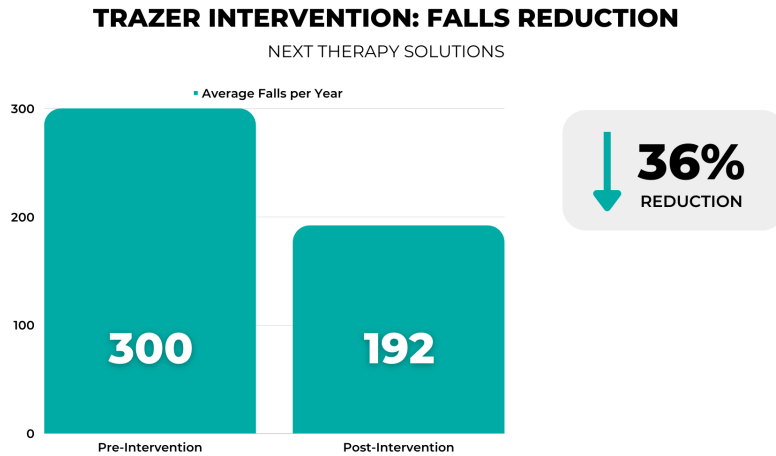


## INTERVENTION OUTCOMES

**Average Falls Prior to Intervention:** 25 / month or 300 / year

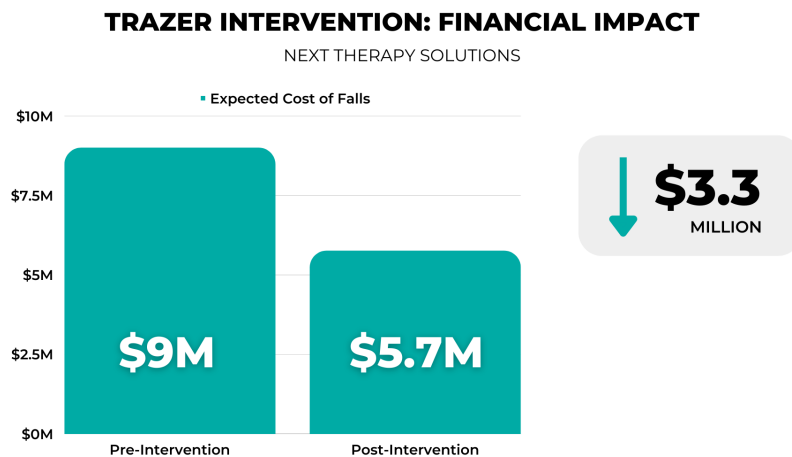
**Average Falls Post-Intervention:** 16 / month or 192 / year

**NEXT Therapy Solutions / TRAZER Intervention resulted in a 36% reduction in falls per month.**



**Run Rate by End of Year:** projected 108 fewer falls per year

**Average Cost for Hospitalization in America per Fall:** \$30,000 according to cdc.gov



## HYPOTHESIS

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It is this writer's hypothesis that the success of the TRAZER intervention is due to multiple factors:

- The subject is fully engaged in the activity: vision, brain, and body.
- The subject is distracted from limiting factors, such as pain, by the entertaining quality of the activity.
- The activity demands multi-directional movement, requiring stopping and starting, which serves to rebuild muscles.
- The brain/body interface rebuilds neuromechanical connections between the brain and the extremities.

This hypothesis can be supported by research involving both collegiate and Olympic athletes who have suffered brain and/or orthopedic injury.

## References:

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“Walking Speed: The Sixth Vital Sign”, Stacy Fritz, PT, PhD; Michelle Lusardi, PT, PhD, Journal of Geriatric Physical Therapy: 2009 – Vol 32, Issue 2, p. 2 – 5

“Improvement of Perceptual-Motor Function among Elite Athletes with Concussion History”, Gary B. Wilkerson, EdD, ATC, FNATA, University of Tennessee at Chattanooga; Dustin C. Nabhan, DC, DACBSP, CSCS, United States Olympic Training Center; Ryan T. Crane, MS, ATC, Emory Healthcare, Atlanta, GA, Journal of Athletic Training (JAT0153-20).

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