VITAL.PT

# Case Study of
# GERIATRIC FALL PREVENTION
# with VITAL.PT


**DR. SHREYA MENDON**
Physiotherapist
(Community MPT)

## INTRODUCTION:

As we age, balance declines due to numerous factors like reduced muscle strength, sensory deficits, and slower reaction times, increasing the risk of falls and major injuries such as fractures. Objective assessments using plantar pressure and balance analysis provide precise insights into stability and postural control. By integrating gamified rehabilitation, this comprehensive approach can help create engaging, personalized training programs that enhance balance, build strength, and reduce fall risk, promoting safer and more independent living for older adults.


## SUMMARY:

An elderly male was experiencing balance and mobility issues with an increased risk of falls. Through comprehensive evaluation, including plantar pressure analysis and balance assessments, a personalized treatment plan was developed. This included fall prevention education, strengthening, balance and flexibility exercises aimed at improving his mobility and reducing fall risk. Regular follow-ups helped track his progress and ensure the effectiveness of the intervention.

## HEALTH STATUS:

A 74-year-old elderly male, complaints of recent balance issues and a fall while walking down the stairs 3 weeks ago. He mentions feeling unsteady when performing tasks like getting out of bed and taking turns.

## HISTORY OF PRESENT CONDITION:

- The patient reports a gradual onset of balance difficulties over the past 2 years, with increased episodes of feeling unsteady while walking and frequent slips.
- He mentions that his walking has become slower and is more cautious.
- The fall 3 weeks ago resulted in no significant injuries but prompted him to seek medical advice.
- He has been feeling more dependent on others for support during mobility tasks.

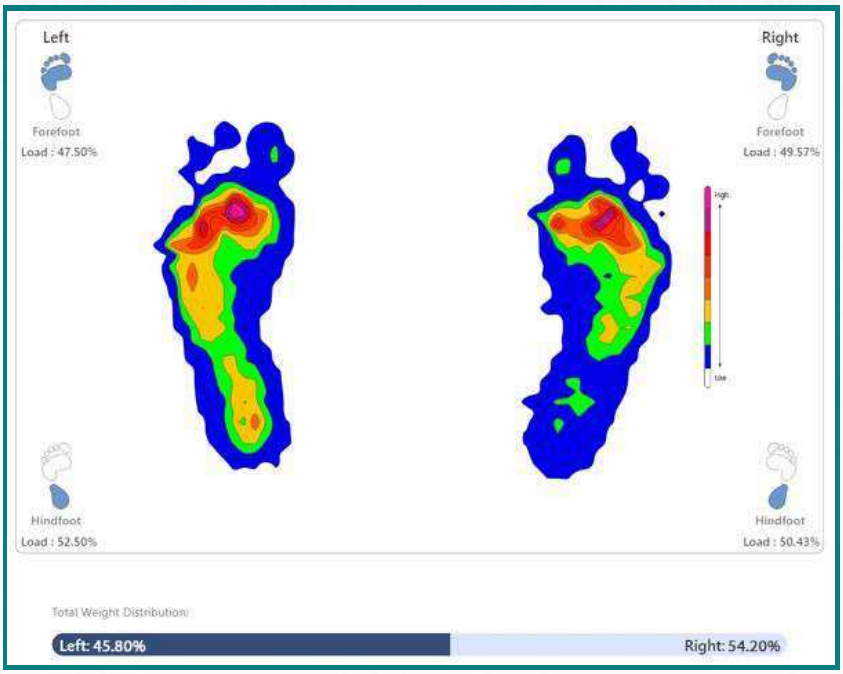
## EVALUATION [SESSION 1]:

- **BMI:** 24.3 (Overweight)
- **Mobility:** Reduced spinal and lower limb range of motion.
- **Strength:** Weak abdominals; hip abductors and extensors; knee extensors, ankle plantar flexors.
- **Gait:** Slow, cautious waddling pattern. There is a reduced stride length with wider base of support. He uses a walking stick for added support during ambulation but avoids navigating stairs and going outside without family assistance.

## VITAL.PT PLANTAR PRESSURE ANALYSIS FINDINGS:

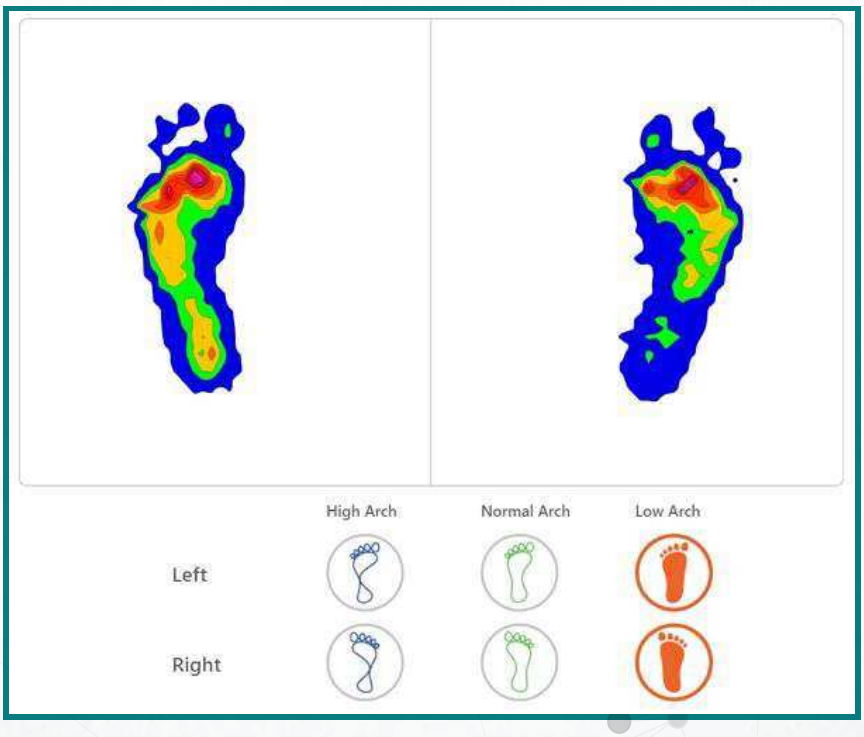
### 1. STANCE TEST:

- Slightly higher weight distribution is observed on the right side, accompanied by altered loading patterns between the forefoot and hindfoot. Age-related changes, including senile kyphosis, weakened plantar flexor muscles, and a hallux valgus deformity, contribute to increased anterior loading on the forefoot.



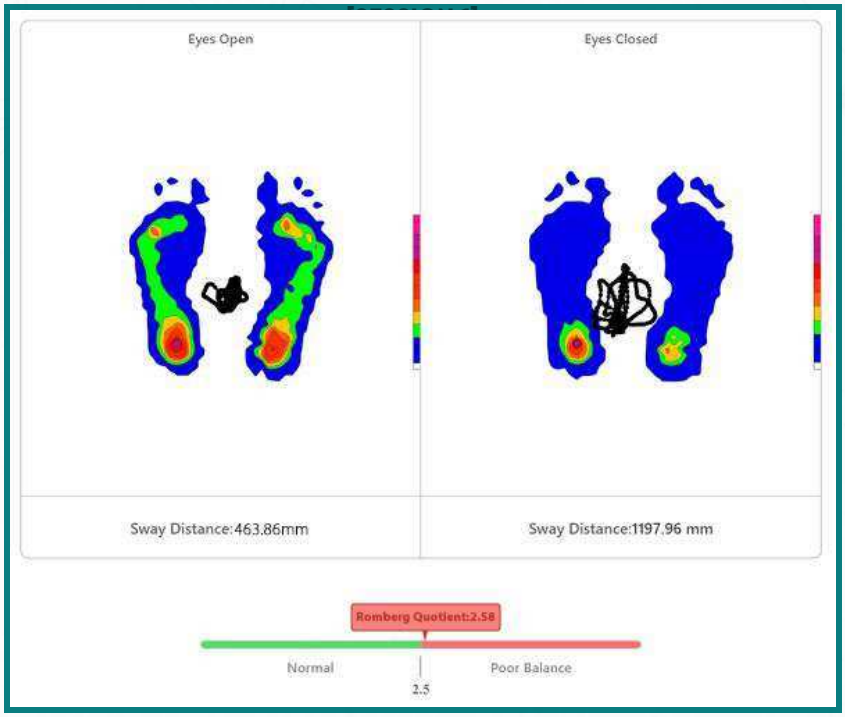

## 2. ARCH TYPE TEST:

- The findings suggest a low arch on both sides, likely resulting from a combination of factors. Age-related ligament laxity weakens the structural support of the arch, while muscle weakness further compromises its stability. Obesity adds excessive stress to the foot, contributing to arch collapse over time. Additionally, the prolonged use of unsupportive footwear exacerbates the condition by failing to provide adequate arch support, leading to progressive flattening.



**3. BALANCE TEST:**

- A large COP (Center of Pressure) scribble observed in the eyes-open condition, combined with a significant increase in sway distance when the eyes are closed, highlights significant proprioceptive deficits. This suggests a reduced ability to rely on sensory input for maintaining stability, particularly in the absence of visual cues. The improper distribution of pressure across the feet reflects overall postural instability. The higher Romberg Quotient (RQ) confirms these findings, pointing to an elevated risk of falls due to compromised balance and sensory integration.




## TREATMENT PLAN:

**1. Patient Education:**

- Education on fall prevention strategies. He is advised necessary home modifications for potential tripping hazards, ensure adequate lighting, and appropriate use of assistive devices.
- He is encouraged to wear supportive, non-slip shoes to improve balance and reduce the risk of falls.

**2. Fall Prevention Program:**

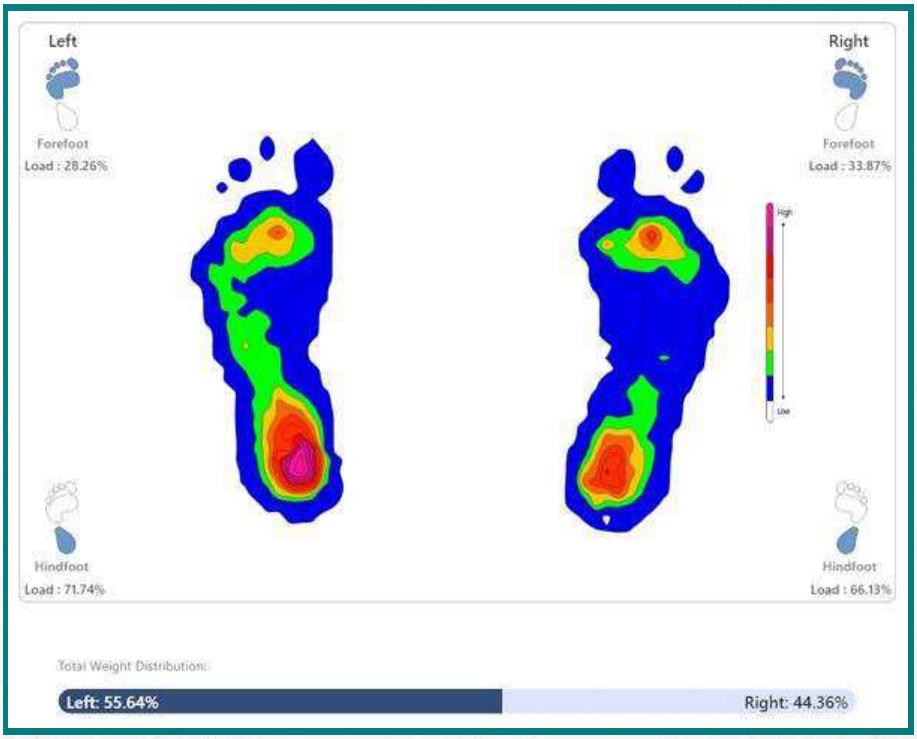
- **To improve mobility:**
  - Active ROM exercises such as cat camel, spinal twists, standing side bends, hip circles, free exercises (1-2 sets of 12 reps)
  - Static stretches for hip flexors, hamstrings and calf (3-5 sets of 20-30 sec holds)

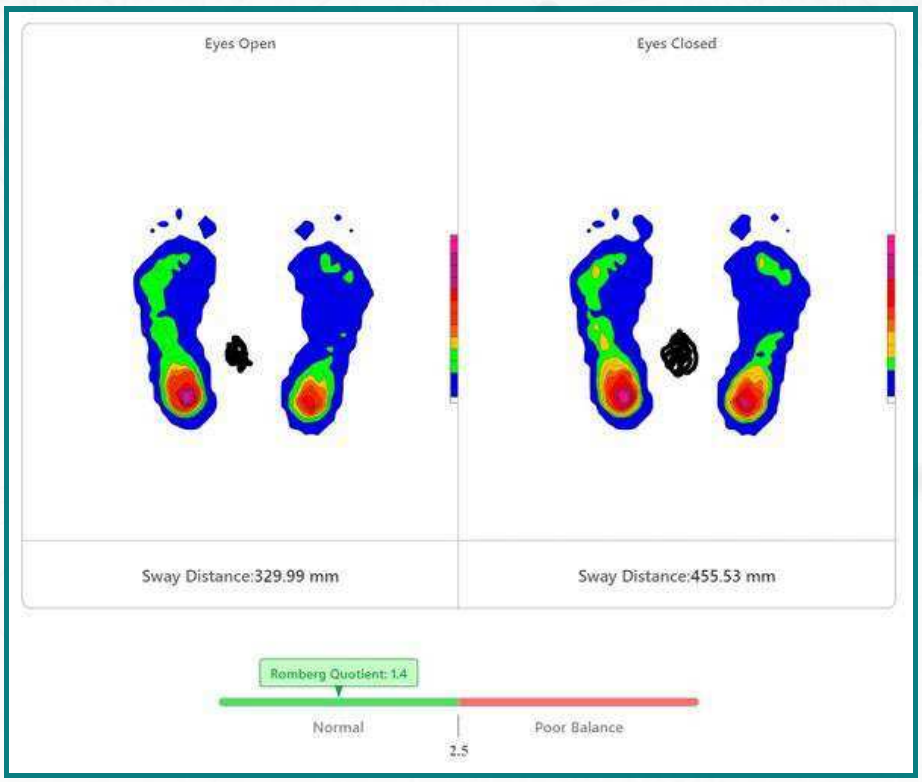
- **To enhance muscle strength:**
  - Lower limb strengthening exercises using resistance band exercises, targeting the core, quadriceps, hamstrings, calves, and glutes.
  - Weight-bearing exercises such as squats and lunges to improve muscle strength and joint stability (2-3 sets of 10-14 reps)

- **Balance Training using ReGo:**
  - Mapple Apple and Shrinking Island games to train for narrow stance then progressing to tandem stance and single leg stance.
  - Shaolin game to train multidirectional directional balance and to activate postural muscles.
  - Shapes (Eight) along with Mouse & Cheese game to train for limits of stability.

## OUTCOME: [SESSION 15]

- **Improved Foot Pressures:** Normal weight distribution between the forefoot and hindfoot was achieved, indicating enhanced alignment.
- **Enhanced Functional Capability and Stability:** Significant reduction in sway distance, reflecting improved postural control and balance. This also led to a noticeable decrease in fall risk, empowering him to perform daily activities independently and with greater confidence.
- **Improved Gait:** Patient developed a more efficient and stable walking pattern, transitioning from assisted to unassisted ambulation, showcasing improved mobility.






## CONCLUSION:

This case study highlights the transformative impact of a structured fall prevention program supported by **Advanced Plantar Pressure Analysis - VITAL. PT and Gamified Rehabilitation**. By addressing the patient's specific needs through personalized interventions, significant improvements were observed in mobility, stability, and overall quality of life. The integration of technology-driven assessments and engaging exercises not only reduced fall risk but also empowered the patient to regain independence and confidence in daily activities. **Vital. PT's** holistic approach demonstrates the potential to revolutionize geriatric care, offering older adults a safer, more active, and fulfilling life.