

# Pilot Study to Assess Benefit of Virtual Reality Game System, Wii, on Balance and Gait in Persons With Parkinson's Disease

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# Pilot Study to Assess the Benefit of a Virtual Reality Game System, Nintendo Wii, on Balance and Gait in Persons With Parkinson's Disease

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## Objective:

To assess the benefit of virtual reality gaming (VRG), using a Nintendo Wii gaming system, to maintain gait and balance in Parkinson's disease.

## Background:

Repetitive, task-oriented activity is important for motor learning.

Virtual reality gaming (VRG), Nintendo Wii, is inexpensive and provides visual and proprioceptive feedback in the context of a repetitive task-specific activity.

It is difficult to demonstrate sustained benefit from physical therapy.

Group exercise programs are utilized to sustain the benefits achieved through physical therapy. Activities employed in these programs include VRG Wii.



## Method:

Ten participants with Parkinson's disease were recruited from a community rehabilitation fitness program on stable medication for 30 days.

All were independent ambulators over age 60.

A physical therapist designed the VRG Wii exercise regimen utilizing Wii Fit balance board with associated gaming software.

Participants engaged in VRG program weekly, for 6 weeks; were assessed at baseline, 6 weeks, and every 4 weeks for 4 months.

## Assessments Included:

1. Unified Parkinson's Disease Rating Scale (UPDRS).
2. Limits of stability using Neurocom's SMART EquiTest.
3. Timed Up and Go (TUG).
4. Gait assessment using GAITRite; cadence, step length, and speed.
5. Global impression statement (GI).
6. Question regarding impulse control (IC).

### References:

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## Results:

Table 1.

Activity	LE	Baseline	Week 26	p Value
Step Length	Right	62.9 cm	68.1 cm	0.002
	Left	61.9 cm	69.7 cm	0.007
Cadence		106.2 steps/min	115.6 steps/min	0.005
Gait Speed		106.2 cm/sec	129.4 cm/sec	0.005
UPDRS ADL Score		8	7	0.05
			<b>Week 10</b>	
Wii Step Aerobics Score		108.5	161	0.015
Wii Half-Moon Score		63	71	0.05

Gait speed and step length correlated as expected (r=.896, p<.001)

\* There were no strong correlations between Wii scores and standard assessments.

## Conclusions:

- Although the study sample was small, use of commercial low cost VRG appears safe and effective in improving and sustaining important functional areas in Parkinson's disease.
- Selection of VRG games may enhance treatment plans.
  - Statistically significant improvement was found in step length, cadence, gait speed, and UPDRS ADL scores.
- Patients engaged in VRG program weekly to augment biweekly community based fitness program.
- Further study is warranted.

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