Configurations of the Six-Minute Walk Test in People with Parkinson Disease: Do the number of turns matter?

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Disclosures

• Dr. Russo has no financial relationship or conflict of interest to disclose
• Dr. Kuettel has no financial relationship or conflict of interest to disclose
• Dr. Mclsaac has no financial relationship or conflict of interest to disclose
Background

• Presentation of Parkinson’s Disease (PD) includes impaired gait, decreased balance, and cognitive deficits.

• PD can also lead to the phenomenon of freezing of gait (FoG) or festination of stepping which can limit activities and restrict participation.

• FoG can be triggered by various environments

Background

• The 6 Minute Walk Test (6MWT) is a valid and reliable outcome measure to assess walking endurance.
  • Chronic Progressive Conditions:
    • Evidence Quality = I; Recommendation Strength = Strong
    • Test-Retest Reliability in PD (ICC of 0.96)
    • Minimal Detectable Change (MDC) for individuals with PD of 82 meters

• Many clinicians and clinics are constrained in space when administering the 6MWT

Aims of Current Study

• To determine if the configuration of the 6MWT (25 feet vs 100 feet) matters in distance walked for individuals with PD.

• Determine if FoG has an effect on distance covered during a 6MWT.
ATS Statement: Guidelines for the Six-Minute Walk Test

This Official Statement of the American Thoracic Society was approved by the ATS Board of Directors
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TECHNICAL ASPECTS OF THE 6MWT

Location

The 6MWT should be performed indoors, along a long, flat, straight, enclosed corridor with a hard surface that is seldom traveled. If the weather is comfortable, the test may be performed outdoors. The walking course must be 30 m in length. A 100-ft hallway is, therefore, required. The length of the corridor should be marked every 3 m. The turnaround points should be marked with a cone (such as an orange traffic cone). A starting line, which marks the beginning and end of each 60-m lap, should be marked on the floor using brightly colored tape.
• A hallway or open area at least 12 meters long with a smooth, consistent surface
• A turnaround point approximately 49 in (124 cm) wide with clear markings should be set up at both ends
Methods - Recruitment

• Inclusion Criteria
  • 18+ years old
  • Hoehn and Yahr Stage 1-3
  • Understand and speak English
  • Able to understand task instructions

• Exclusion Criteria
  • Unable to ambulate 6 minutes
  • Contraindications to exercise
  • Comorbidities that inhibit ability to participate in study
Methods

• Participants were placed in either “FoG” or “Non-FoG” group according to score on “New Freezing of Gait Questionnaire”

• Order of presentation of the 25-foot or 100-foot configuration was counterbalanced and performed ~ one week apart.

• Participants were given instructions per the standardized “American Thoracic Society” protocol for the 6MWT

## Participant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Non-FoG (n = 11)</th>
<th>FoG (n = 12)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>69.0 ± 5.8</td>
<td>71.3 ± 6.7</td>
<td>.388</td>
</tr>
<tr>
<td>H&amp;Y</td>
<td>2.2 ± .4</td>
<td>2.6 ± .5</td>
<td>.051</td>
</tr>
<tr>
<td>MDS-UPDRS</td>
<td>31.8 ± 5.5</td>
<td>38.9 ± 10.3</td>
<td>.055</td>
</tr>
<tr>
<td>MoCA (out of 30)</td>
<td>26.5 ± 3.2</td>
<td>26.8 ± 1.4</td>
<td>.771</td>
</tr>
<tr>
<td>N-FoGQ</td>
<td>0</td>
<td>16.8 ± 7.0</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
Results – main effects

- **p < .001**
  - **Configuration**
    - 25-ft: 367
    - 100-ft: 428

- **n.s. p = .056**
  - **Group**
    - nonFOG: 452
    - FOG: 346
Results – no interaction

No interaction $p=.096$
Clinical Comparisons

- Minimal Detectable Change (MDC) in the 6MWT for people with PD is **82 m**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Average Difference (m)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-foot vs. 100-foot</td>
<td>63</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>FoG vs. Non-FoG</td>
<td>104</td>
<td>.056</td>
</tr>
<tr>
<td>FoG vs. Non-FoG in 25-foot configuration</td>
<td>115</td>
<td>.150</td>
</tr>
<tr>
<td>FoG vs. Non-FoG in 100-foot configuration</td>
<td>92</td>
<td>.018</td>
</tr>
</tbody>
</table>

Conclusion – Clinical Implication

• The number of turns DO matter for people with PD

• If constrained on space, maintain consistency of configuration

• Document configurations and/or protocol followed

• Fewer sharp turns, such as in the Clinical Practice Guidelines 6MWT, may create less problems than the 100-ft or the 25-foot for people with PD, but this would need to be explored.
Questions?
Conclusion – Clinical Implication

Clinical Practice Guideline for 6MWT

49 in (3 ft)

39 ft

American Thoracic Society Guidelines for 6MWT

100 ft

25 ft
Additional data not yet reported

CW or CCW
N=17
(FoG=4; n-FoG=13)
Mean distance: 471 m