Outcome Measures for the Clinician

Four Square Step Test (FSST)

Special contributions made by:
Jason Kahle - Jason Highsmith
Brian Kaluf - Tyler Klenow
Introduction

• Outcome measures are clinical tests that are used to evaluate a patient’s level of function in certain rehabilitation domains including mobility, ambulatory status, and balance.

• The “Outcome Measures for the Clinician” series is designed to give the average clinician the tools to perform outcome measures in the clinic and use outcome measures to improve clinical evaluation, enhance clinical notes, and improve reimbursement for O & P interventions.

• Outcome measures can be used to show medical necessity for orthotic and prosthetic interventions by showing that a patient can:
  • Achieve a required milestone like variable cadence
  • Surpass a threshold of reduced fall risk
  • Return to a score that is average among a patient’s normal peers
  • Improve a score by a clinically significant amount

• *References and information from this presentation may be copied into clinical notes and letters of medical necessity.

• *A comprehensive instructional video of the outcome measure will be included as part of this presentation.
Using Outcome Measures

• Outcome measures should be used in an initial evaluation of a patient to establish a baseline score for future comparison.
• A measure should be repeated after the delivery of an O & P intervention to show improvement in function and to show medical necessity.

• Reasoning for use of an outcome measure should also be included in clinical notes including:
  • Validity
    - The ability of an outcome measure to test what it is intended to test
  • Reliability
    - The ability of an outcome measure to be consistently repeated
  • Minimum Detectable Change (MDC)
    - The smallest difference in a test score that can be determined to be significant
  • Normative Data
    - Score ranges from normal and pathological populations from which to compare
Overview – Four Square Step Test

- **Purpose**: To assess dynamic stability and the ability of the subject step over objects forward, lateral, and backward

<table>
<thead>
<tr>
<th>Four Square Step Test Psychometrics</th>
<th>Reliable</th>
<th>Valid</th>
<th>MDC</th>
<th>Normative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Not Tested</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)
Requirements – Four Square Step Test

• **Time**: < 5 minutes

• **Equipment**
  • 4 canes
  • Or 4 similar barriers
  • 2.5cm or 1 in. in ht.
  • Stopwatch

• **Space**
  • About 25 sq. ft.
    • Most patient rooms

• **Personnel**: 1-2 persons

• **Cost**: Free
**Procedure – Four Square Step Test**

- Subject begins standing in square 4
- Instruction: “As fast as possible without touching the canes touch both feet in each square clockwise and then counterclockwise to complete 1 trial”
- “Both feet must make contact with the floor in each square. If possible, face forward during the entire sequence.”
- Start time at 1st contact in square 1, end time when subject returns both feet to square 4
- 1 demo and 1 untimed practice trial
- 2 trials performed, best time recorded

Video – Four Square Step Test
Interpretation – Four Square Step Test

**Threshold Values**

<table>
<thead>
<tr>
<th>Population</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Extremity Amputees</td>
<td>&gt;24 sec.(^5)</td>
</tr>
<tr>
<td>Geriatric Population</td>
<td>&gt;15 sec.(^2)</td>
</tr>
<tr>
<td>Acute Stroke</td>
<td>&gt;15 sec.(^6)</td>
</tr>
<tr>
<td>Parkinson’s Disease</td>
<td>&gt;9.68 sec.(^4)</td>
</tr>
</tbody>
</table>

**Validity**

- Excellent for geriatric population\(^2\)
- Excellent for Acute Stroke population\(^6\)
- Adequate for Parkinson’s Disease \(^4\)

**Normative Data**

**Balance and Mobility Times for Older Adults\(^2\)**

<table>
<thead>
<tr>
<th></th>
<th>Multiple Fallers</th>
<th>Non-multiple Fallers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean +/- SD</td>
<td>32.6 sec +/- 10.1</td>
<td>17.6 sec +/- 8.3</td>
</tr>
</tbody>
</table>

**FSST Times for Acute Stroke Patients\(^6\)**

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Mean +/- SD</td>
<td>20.8 sec +/- 15.0</td>
</tr>
<tr>
<td>Range</td>
<td>6.1-60.1 sec</td>
</tr>
<tr>
<td>Subjects w/ failed trials</td>
<td>62%</td>
</tr>
</tbody>
</table>
References – Four Square Step Test


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