## Wheelchair Skills Test (WST)

### Assessment Overview

#### Assessment Area

<table>
<thead>
<tr>
<th>ICF Domain:</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Subcategory:</td>
<td>Mobility</td>
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</tbody>
</table>

#### Summary

The Wheelchair Skills Test (WST) is a performance-based measure designed to objectively evaluate manual wheelchair skills and safety. There are multiple versions of this measure for manual chairs, powered chairs, and scooters, for both wheelchair users and their caregivers. The WST may be administered by a tester/trainer that supervises and scores the test or in self-report/questionnaire form (WST-Q).

As of August 2016, the latest revision of the WST is version 4.3.3. The Wheelchair Skills Test assesses the level of wheelchair skills required for daily functioning. The WST can be used during the initial provision of the wheelchair and as necessary at follow-up. The materials are continuously being updated for free so visit [www.wheelchairskillsprogram.ca](http://www.wheelchairskillsprogram.ca) for any updates.

#### You Will Need

**Administration:**
- Approximately 30 minutes to complete 34 Tasks (Manual) or 30 Tasks (Power) (Standard Version).
- Approximately 10 minutes to complete 34 Tasks (Manual) or 30 Tasks (Power) (Questionnaire version).
- It may be necessary to have a spotter in addition to the tester/trainer for supervision and safety.

**Scoring**
- Each skill is scored from 0-2 (Fail = 0; Pass with Difficulty or Assistance = 1; Pass = 2)
- Some skills may be marked NP (Not Possible); they can be subtracted from the denominator to avoid affecting the Total Score
- The tester should also record any comments that are instructive (e.g. the reasons for any task failures, left-right asymmetry).
- To get a percentage WST Capacity Score add up all scores, divide by number of skills attempted and multiply by 2 (and 100%).

**Equipment:**
- Approximately 1000 square feet of space
- A standardized wheelchair circuit or access to a variety of natural barriers (e.g. ramps, curbs, potholes, etc.)

#### Availability

Download here:


As of August 2016, the current version is 4.3.3 and a full instruction manual are available at:


Available in: English, French ([www.wheelchairskillsprogram.ca/fre](http://www.wheelchairskillsprogram.ca/fre)).
### Assessment Interpretability

<table>
<thead>
<tr>
<th>Minimal Clinically Important Difference</th>
<th>Statistical Error</th>
<th>Typical Values</th>
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</thead>
<tbody>
<tr>
<td>Not established in SCI</td>
<td>Not established in SCI</td>
<td>Mean total score:</td>
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<tr>
<td></td>
<td></td>
<td>All participants: <strong>80.7±11.8</strong></td>
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<tr>
<td></td>
<td></td>
<td>Tetraplegia: <strong>72.1±7.9</strong></td>
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<tr>
<td></td>
<td></td>
<td>High paraplegia: <strong>82.8±9.1</strong></td>
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<tr>
<td></td>
<td></td>
<td>Low paraplegia: <strong>84.0±12.4</strong></td>
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<td>55.6% of participants scored over 80% (considered the cut-off for distinguishing people with advanced MWC skills (e.g. skills required to control wheelies))</td>
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<tr>
<td></td>
<td></td>
<td>(Lemay et al., 2011; N=54, 41 male)</td>
</tr>
</tbody>
</table>
# Measurement Properties

## Validity – **Moderate to High**

**Moderate** correlation with wheeled distance per day:
- Pearson’s $r = 0.36$

**Moderate** negative correlation with age:
- Pearson’s $r = -0.32$ \( (\text{Lenay et al., 2011; N=54, 41 male}) \)

### Predictive validity:
- WST predicts CHART and SWLS scores \( (\text{Hosseini et al., 2012; N=214}) \)
- **Moderate** Concurrent validity with admission and discharge FIM scores:
  - Spearman’s $\rho = 0.38$ and $0.31$ \( (\text{Kirby et al., 2004; N=298; only 11% SCI – others are ABI, Stroke, Amputees, musculoskeletal conditions}) \)

### Number of studies reporting validity data: 7

**High** Concurrent validity between the WST and the WST-Q:
- Pearson’s $r = 0.65$ \( (\text{Rushton et al. 2016; N = 72; 36 males, Mean age 60.7 (7.3) SCI = 19% of study population}) \)

## Reliability – **Moderate to High**

**Moderate** to **High** Test-retest Reliability:
- ICC = 0.84~0.94 \( (\text{For measured speeds; Pradon et al., 2012; N=40, 30 male}) \)
- Spearman’s $\rho = 0.65$ \( (\text{ Kirby et al., 2002; N=24, 16 male, 3 SCI}) \)
- ICC = 0.91 \( (\text{for v.4.1 with Manual Wheelchairs: Lindquist et al., 2010}) \)

**Moderate** to **High** Inter-rater Reliability:
- ICC = 0.92~0.95 \( (\text{For measured speeds; Pradon et al., 2012; N=40, 30 male}) \)
- Spearman’s $\rho = 0.95$ \( (\text{ Kirby et al., 2002; N=24, 16 male, 3 SCI}) \)
- ICC = 0.855 \( (\text{for MWC v.4.1: Lindquist et al., 2010; N=11, SCI = 9}) \)

**High** Intra-rater Reliability:
- Spearman’s $\rho = 0.96$ \( (\text{ Kirby et al., 2002; N=24, 16 male, 3 SCI}) \)
- Intra-rater = 0.950 \( (\text{for Manual Wheelchairs v.4.1: Lindquist et al., 2010; N=11, SCI = 9}) \)

**High** Internal Consistency:
- Cronbach’s $\alpha = 0.90$ \( (\text{Rushton et al. 2016; N = 72; 36 males, Mean age 60.7 (7.3) SCI = 19% of study population}) \)

### Number of studies reporting reliability data: 5

## Responsiveness

### Floor/Ceiling Effect:
Not established in SCI

### Effect Size:
The SEM and SRD were 5.0 and 6.2 respectively. 
\( (\text{Rushton et al. 2016; N = 72; 36 males, Mean age 60.7 (7.3)}) \)

### Number of studies reporting responsiveness data: 0