



THE RELATIONSHIP OF AMBULATORY SPEED AND EFFICIENCY TO WALKING INDEX FOR SPINAL CORD INJURY (WISCI) LEVEL IN CHRONIC SPINAL CORD INJURY (SCI)

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BACKGROUND

The Walking Index for Spinal Cord Injury (WISCI) was conceived as an instrument that would measure improvements in ambulation following SCI more precisely than current instruments. Concurrent validity, face validity and reliability have been reported previously.¹ This study is intended to study the relationship of ambulation speed and physiologic cost index (PCI) to WISCI level in chronic spinal cord injury.

TABLE 1: Scoring Sheet (Walking Index for Spinal Cord Injury)

Form for WISCI Scoring Sheet (Walking Index for Spinal Cord Injury). Includes fields for Patient Name, Date, FIM Locomotion Score, Mode (walk or wheelchair), Stairs, Gait Type (Reciprocal, Swing through), and a table of Descriptors (DEVICES, BRACES, ASSISTANCE) for WISCI Levels 0-20. The table lists the level, devices used, braces used, assistance provided, and distance ambulated.

LEVEL	DEVICES	BRACES	ASSISTANCE	DISTANCE
0				Unable
1	Parallel bars	Braces	2 persons	< 10 meters
2	Parallel bars	Braces	2 persons	10 meters
3	Parallel bars	Braces	1 person	10 meters
4	Parallel bars	No braces	1 person	10 meters
5	Parallel bars	Braces	No assistance	10 meters
6	Walker	Braces	1 person	10 meters
7	Two crutches	Braces	1 person	10 meters
8	Walker	No braces	1 person	10 meters
9	Walker	Braces	No assistance	10 meters
10	One cane/crutch	Braces	1 person	10 meters
11	Two crutches	No braces	1 person	10 meters
12	Two crutches	Braces	No assistance	10 meters
13	Walker	No braces	No assistance	10 meters
14	One cane/crutch	No braces	1 person	10 meters
15	One cane/crutch	Braces	No assistance	10 meters
16	Two crutches	No braces	No assistance	10 meters
17	No devices	No braces	1 person	10 meters
18	No devices	Braces	No assistance	10 meters
19	One cane/crutch	No braces	No assistance	10 meters
20	No devices	No braces	No assistance	10 meters

METHODS

We recruited 30 subjects with chronic SCI (≥ 12 months duration) who ambulated at least once a week. In a supervised setting, subjects ambulated at their functional WISCI level and maximum WISCI level. The *functional WISCI* level was defined as the WISCI level the individual utilizes in the community or alternatively the home if the subject was not a community ambulator. The *maximum WISCI* level was defined as the highest WISCI level for which the subject could ambulate 10 meters

and still be deemed safe by the research physical therapist. For testing purposes, subjects ambulated 100 meters or alternatively, as far as possible (distance recorded). Ambulatory speed (m/min) and continuous heart rate were measured during testing for both WISCI levels. Physiologic cost index (PCI) was used as a measure of gait efficiency and was calculated using the equation $\Delta HR / \text{velocity (m/min)}$.²

CONCLUSIONS

These results suggest that chronic SCI patients intuitively select the most efficient level of function for everyday, practical (community/household) ambulation. Furthermore, this differs from what they are capable of for short distances (maximum WISCI).

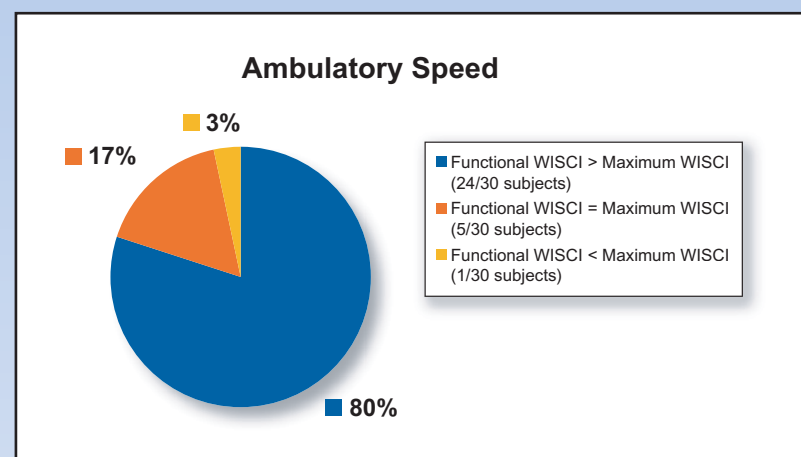
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RESULTS



The average difference between the functional WISCI and maximum WISCI was 2.86 levels. For most subjects, ambulation speed and gait efficiency (\downarrow PCI) was greater for the *functional WISCI* compared to *maximum WISCI* level.

