DEVELOPMENT OF A CLINICAL MEASURE OF 180° TURNING FOR POST-STROKE HEMIPLEGIC PATIENTS

H-I Chen1,3, C-Y Chen2, W-S Huang1, Y-C Chung1, P-F Tang3
1 Department of Physical Therapy, HungKuang University
2 Department of Rehabilitation, Chang-Gung Memorial Hospital
3 School and Graduate Institute of Physical Therapy, National Taiwan University
Correspondence to P-F Tang; email: pftang@ntu.edu.tw

INTRODUCTION
The purposes of this study were to develop a clinical assessment tool of 180° turning for hemiplegic patients following stroke, and to test the reliability and validity of this clinical tool. The process of developing this measure had three phases. Phase I was aimed to identify turning characteristics specific to stroke. Phase II was aimed to reduce and refine the measurement items. Phase III was the reliability and validity test.

METHODS
Phase I: Twelve patients with hemiplegia after stroke of various severity were videotaped while performing 180° in-place turning to the unaffected and affected sides. The turning characteristics specific to these patients were identified and analyzed by two investigators (HIC and PFT). Nineteen measurement items were generated for the turning measure in this phase.

Phase II: Eleven experienced physical therapists were consulted. They scored perceived importance level for each of the 19 items based on a 5-point scale. A score of 5 indicated highly important and 1 indicated not at all important. Four items with the average score of 3.5 or less were removed. The final version of this measurement included 15 items, which were classified into three categories: 4 in basic, 2 in quantitative and 9 in qualitative categories. The qualitative items, primarily measuring the trunk stability and lower extremity movements during turning, were rated on a 3-point scale with 2 suggesting the best performance and 0 indicating the poorest performance. The total score of the 9 qualitative items was 18.

Phase III (reliability and validity tests): Twenty-three (18 men and 5 women, age range= 44-76 years, post onset days= 15-186 days, NIHSS= 2-22) hemiplegia patients with stroke were further recruited into this study. All subjects performed 180° in-place turning and performance was videotaped. Intra-rater reliability of one investigator (HIC) was assessed by rating the same recorded performance of all subjects twice with a one-week interval between the two rating sessions. For testing inter-rater reliability, results of the first rating session of the investigator (HIC) and the independent rating performed by the 2nd trained rater (CYC) were compared. Subjects’ performance on the Postural Assessment Scale for Stroke (PASS) was also recorded and rated (WSH) for testing concurrent validity.

RESULTS AND DISCUSSION
The intraclass correlation coefficients for measuring the intra- and inter-rater reliability of 2 quantitative items and the total score of 9 qualitative items are reported in Table 1. The coefficients of all qualitative items ranged from .64 to .93 and from .45 to .89 for intra- and inter-rater reliability, respectively. The internal consistency of all measurement items was analyzed. The Cronbach α-coefficient was .87. The correlations between the number of steps and PASS score were -.49 and -.51 (p < .001) for turning to the unaffected and affected side, respectively. The correlations between the time taken to turn and PASS score were -.54 and -.45 (p < .001) for turning to the unaffected and affected side, respectively.

Our finding of excellent inter- and intra-rater reliability of 2 quantitative items are consistent with other turning measures designed for older adults [1,2]. Also similar to previous studies [2], most of the qualitative items of this turning measure only showed moderate reliability.

Patients’ performance on this turning measure was moderately correlated to that on the PASS. This result indicates that patients with better postural ability need less steps and time to complete the 180° in-place turning. Concurrent validity of this measure with other balance or mobility scales may need to be further tested.

CONCLUSIONS
The newly developed measure appears to be a reliable and valid turning assessment tool for hemiplegia patients with stroke and may be potentially useful in clinical practice.

REFERENCES

ACKNOWLEDGEMENTS
Supported by NHRI-EX96-9210EC & NHRI-EX95-9210EC.

Table 1: Mean and reliability for two quantitative items and total score of nine qualitative items.

<table>
<thead>
<tr>
<th>Measurement Items</th>
<th>Intra-Rater</th>
<th>Inter-Rater</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>ICC3, 1</td>
</tr>
<tr>
<td>Turn steps</td>
<td>4.5 ± 2.1</td>
<td>.97 (.94-.98)</td>
</tr>
<tr>
<td>Turn time (sec)</td>
<td>3.8 ± 2.1</td>
<td>.91 (.84-.95)</td>
</tr>
<tr>
<td>Total score</td>
<td>12.9 ± 3.8</td>
<td>.98 (.96-.98)</td>
</tr>
</tbody>
</table>