

Multidimensional Assessment of Tremor in Multiple Sclerosis

A Useful Instrument

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*Tremor is a common symptom of multiple sclerosis (MS) that has debilitating effects on occupational performance and well-being. Tremor is complex, and a valid and reliable assessment tool that takes a multidimensional approach is needed to guide intervention decisions. A new assessment instrument, the Multidimensional Assessment of Tremor (MAT), was designed to measure the severity and functional impact of tremor in people with MS. This study was conducted to introduce this new tool and examine its reliability, validity, and clinical utility. Two clinicians tested the MAT and completed a questionnaire on its clinical utility. During an initial visit, 10 study participants with MS were administered the MAT, which was independently scored by two researchers to determine its inter-rater reliability. Four other tools commonly used to assess tremor were also administered to evaluate the MAT's criterion validity. During a second visit, the MAT was administered a second time to ascertain its test-retest reliability. Study participants demonstrated mild-to-severe tremor with marked functional difficulties. The MAT's inter-rater reliability and test-retest reliability were excellent, while its criterion validity ranged from poor to good. The clinicians, participants, and researchers found the clinical utility of the tool to be good. The MAT offers therapists a clinically useful, evidence-based, and multidimensional tool for evaluating tremor in MS. *Int J MS Care.* 2010;12:23–32.*

Tremor is a noticeable symptom of multiple sclerosis (MS). It is defined as a rhythmic, involuntary oscillatory movement of an area of the body.¹ Tremor caused by MS can affect the head, neck, vocal cords, trunk, and limbs, but it is most common in the arms.² The two most prevalent forms of tremor in MS are postural tremor (present when holding a position against gravity) and intention tremor (present during goal-directed movement, worsening as the individual approaches a target).² Several studies have examined the prevalence of tremor in people with MS. Alusi et al.³ reported a total prevalence of 58%: the severity was minimal in 27%, mild in 16%, and moderate-to-severe in 15%. A review of the literature conducted by Koch et al.² found a prevalence range of 26% to 58%.

Tremor can be incapacitating, seriously impairing functioning and ability to perform activities of daily living. People with MS-related tremor report that the most difficult daily activities are those requiring small, precise movements.¹ In a study of the effects of upper-limb tremor in people with MS, Feys et al.⁴ found that it interfered with eating, drinking, grooming, and dressing. Tremor also negatively affects psychosocial functioning, leading to embarrassment¹ as well as depression and anxiety.⁵

Occupational therapy has been shown to reduce disability and improve or delay declines in health and functioning in individuals with MS.⁶ Occupational therapists can also provide numerous aids and strategies to help people cope with tremor.⁴ The ability to provide effective interventions, however, depends on the availability of a reliable and valid instrument with which to evaluate patients for tremor.⁷

A variety of tools exist for assessing tremor, including performance-based tests, functional questionnaires, and tremor severity scales.² Less common forms of assessment include accelerometry, polarized light goniometry,

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and a quantitative movement analysis technique that records patients' goal-directed movements using an electromagnetic tracking device.² These approaches all have advantages and disadvantages, with each capturing selected elements of the tremor experience. An overwhelming limitation of all of them, however, is their unidimensional view of a complex symptom. As reported by individuals with MS in a previous pilot study (SR Vance and KJ Condon, unpublished data, 2006), tremor is multidimensional in terms of presentation and impact. Therefore, a multidimensional assessment method is needed to provide a comprehensive picture of the symptom and guide treatment decisions. Until recently, no such assessment tool existed. This prompted development of the Multidimensional Assessment of Tremor for Occupational Performance Issues (MAT-OPI) (T Henne and KJ Waldorf, unpublished data, 2007), subsequently shortened to Multidimensional Assessment of Tremor (MAT). This new battery provides information on the severity, functional impact, and psychosocial implications of tremor in MS.

The present study was conducted to introduce the MAT and to examine its preliminary clinicometrics, including reliability, validity, and clinical utility. The following research questions were addressed: 1) Is the MAT a reliable tool over time (test-retest reliability) and between raters (inter-rater reliability)? 2) Does the MAT have criterion validity? 3) Does the MAT have good clinical utility?

Multidimensional Assessment of Tremor

The MAT consists of four components that characterize several dimensions of tremor in MS (Table 1). Part A elicits a subjective description of tremor and its effect on activities of daily living. Part B elicits a subjective description of how tremor and its impact on function affect the individual emotionally. Part C is the Tremor Severity Scale (TSS), adapted from the Fahn Tremor Rating Scale (FAHN). It is an objective measure of tremor severity in various locations of the body and includes postural, intention, and task-related tremor. Part D is the Functional Severity Scale (FSS) and uses a self-report format to rate the ability to perform various daily activities. Higher scores indicate both greater difficulty performing an activity and a higher percentage of time experiencing functional limitations related to that task. A detailed breakdown of each activity is included with this scale and described in the assessment manual.

Table 1. Description of the Multidimensional Assessment of Tremor

Component	Description	No. of items	Scale
Part A: Description of Tremor	Elicits a subjective description of tremor and how it affects a person's activities of daily living	7	Narrative
Part B: Psychosocial	Elicits a subjective description of how tremor and its impact on function affect a person emotionally	5	Narrative
Part C: Tremor Severity Scale	An objective measure of the severity of postural, intention, and task-related tremor of the head, trunk, and upper and lower extremities	16	Likert (0–4)
Part D: Functional Severity Scale	A subjective self-report scale in which clients rate the effect of tremor on their ability to perform various daily activities	30	Likert (0–4)

The MAT also provides an overall Tremor Impact Score (TIS), which is classified as low, moderate, or high, with each of these categories and score calculations defined in the manual.

The MAT was developed on the basis of two preliminary studies. The first was a pilot study involving three people with MS who completed an interview and an early version of the MAT (SR Vance and KJ Condon, unpublished data, 2006). During the interviews, participants shared their experience with tremor (location, intermittent or persistent nature, and factors affecting it) and any psychosocial implications. The second study modified the original version of the MAT to include a description of tremor and daily routine as well as sections on hand dominance and psychosocial issues. In addition, Part D, the FSS, was refined by dividing the item "computer use" into "typing" and "mouse control," and separating "cooking" into "meal preparation from scratch" and "meal preparation of previously prepared foods." Moreover, four new categories were added: "brushing teeth," "hobbies," "exercise," and "handling money." Activities omitted were wrapping presents and using a lighter. This revised version of the MAT was then reformatted, an administration manual created and tested with seven MS patients, and the content validity confirmed (T Henne and KJ Waldorf, unpublished data, 2007). The instrument's clinical utility and reliability, as well as criterion validity, have not been previously tested and are the focus of the present study.

Parameters for Clinicometric Evaluation

Reliability refers to the extent to which an assessment tool measures a concept or an entity consistently. Two types of reliability were tested in this study: inter-rater reliability (the consistency between two or more observers performing the same assessment at one point in time) and test-retest reliability (the consistency of test scores over time).

Validity refers to whether an assessment tool measures what it is intended to measure. This study examined criterion validity, which involves determining whether a tool provides results similar to those provided by another validated measure, scale, or “gold standard.”⁸

Clinical utility is also important to establish when testing an assessment tool, because clinicians will not use an instrument that is difficult or time-consuming to administer. Several aspects of clinical utility must be investigated: clarity of the instructions, format of the test, need for special equipment, time required to complete the assessment, and training required to administer and interpret the measure.⁸

Methods

Participants

This study had two types of participants: individuals with MS and clinicians. Clinician participants were recruited from those who reported interest in testing the MAT with MS patients with tremor when the MAT was introduced at a conference.⁹ Using a snowball sampling method, these clinicians were invited to recruit other clinicians who work with MS patients with tremor to participate in evaluation of the instrument. Convenience sampling was used to recruit participants with MS from an MS clinic by means of recruitment posters and direct referral by clinic personnel.

Clinician and MS participants were eligible for inclusion in the study if they were aged 19 years or older, were fluent in English, and were willing to participate in the study. Participants with MS were also required to have a confirmed diagnosis of MS with no relapse for the past 30 days, be medically stable, and experience tremor. MS participants were excluded from the study if they had a cognitive impairment that would affect reliable participation in the study, had another condition that could dominate their health, had initiated or changed a disease-modifying therapy within 3 months of the screening, or had been treated with oral or systemic

corticosteroids or corticotropin within 4 weeks of the screening.

The study was granted ethical approval from the university and hospital research review boards.

Measures Used to Test Criterion Validity

Criterion validity is established when a measure provides results similar to those of another validated assessment tool, scale, or “gold standard.”⁸ Because the MAT has several components, multiple measures were deemed necessary to ensure relevance. Parts A and B were not tested for criterion validity because they are based on subjective report. A total of four different instruments were used to assess the criterion validity of Parts C and D. Two measures were used for Part C and three for Part D, with one measure, the Washington Heights–Inwood Genetic Study of Essential Tremor (WHIGET), used for both because it includes aspects relevant to both tremor severity (Part C) and function (Part D) (Table 2).

Washington Heights–Inwood Genetic Study of Essential Tremor (WHIGET)

The WHIGET is a reliable and valid scale to evaluate essential tremor in adults aged 65 years and older.¹⁰ Clinicians rate tremor using a Likert scale of 0 to 4 while the participant performs five functional tasks: pouring, drinking, using a spoon to handle liquid, touching finger to nose, and drawing a spiral. A higher score indicates a more marked tremor.¹¹

Upper Extremity Performance Evaluation Test for the Elderly (TEMPA)

The TEMPA is a valid test to measure upper-limb extremity function in people with MS.¹² Clinicians rate

Table 2. Measures used to determine criterion validity

Component	Measure
Part A: Description of Tremor	NA
Part B: Psychosocial	NA
Part C: Tremor Severity Scale	<ul style="list-style-type: none"> • Washington Heights–Inwood Genetic Study of Essential Tremor • FAHN Tremor Rating Scale
Part D: Functional Severity Scale	<ul style="list-style-type: none"> • Washington Heights–Inwood Genetic Study of Essential Tremor • Upper Extremity Performance Evaluation Test for the Elderly • Tremor Activity of Daily Living Questionnaire

Abbreviation: NA, not applicable.

tremor using a Likert scale of 0 to 3 while the participant performs nine unilateral and bilateral tasks such as picking up and moving a jar, unlocking a lock, and picking up small objects. A higher score indicates a greater inability to perform activities due to tremor.

Tremor Activity of Daily Living Questionnaire (TADL)

The TADL is a reliable and valid tool to measure tremor in people with MS.³ The participant rates the degree to which tremor affects performance of 25 daily activities using a Likert scale of 1 to 4. A higher score indicates a greater inability to perform activities due to tremor.

Fahn Tremor Rating Scale (FAHN)

The FAHN is a reliable tool to assess movement disorders in patients with MS.⁷ Clinicians rate the severity of tremor in various locations in the body using a Likert scale of 0 to 4. A higher score indicates a more marked tremor.¹³

Data-Collection Procedures

Stage 1

Clinician participants were sent a package, either by post or e-mail, that included a study introduction letter, a consent form, the MAT, and a feedback questionnaire. They were asked to administer the MAT to patients with MS who experienced tremor, complete the feedback questionnaire, and return it by mail. When these questionnaires were received, the feedback was used to revise the MAT before beginning Stage 2.

Stage 2

Participants with MS took part in two data-collection sessions. During the first session, the MAT was administered and independently scored by two researchers (BD and DH) to establish inter-rater reliability. In addition, the four measures used to determine criterion validity were administered. During the second session, the MAT was administered and scored by one rater in order to examine test-retest reliability. During both sessions, patients had the opportunity to provide comments on their experience participating in the study. The second session took place an average of 16.9 days after the first session (range, 1–41 days). Sessions took place either during an MS clinic visit or in the participant's home, depending on convenience and accessibility for the participant.

Statistical Analysis

Inter-rater and test-retest reliabilities were analyzed using the Cronbach α and intraclass correlation coefficients (ICCs), with a 95% confidence interval (CI). Criterion validity was analyzed using the nonparametric Spearman correlation coefficient by comparing total scores for the four individual assessment tools with the individual section scores of the MAT. The level of statistical significance was set at $P \leq .05$. Correlations ranging from 0.00 to 0.25 were rated poor; 0.25 to 0.50, fair; 0.50 to 0.75, moderate to good; and 0.75 to 1.00, good to excellent.¹⁴ Two-tailed testing was used. The data were analyzed using SPSS, version 14 (SPSS, Chicago, IL).

Results

Stage 1

Two clinicians participated in Stage 1 of the study. The low number of clinician participants was attributed to the limited availability of patients with MS on clinician caseloads during the data-collection period.

Clinicians indicated through the feedback questionnaire that the MAT provided a good description of tremor (Part A) and a clear account of the psychosocial effects of tremor (Part B). The TSS (Part C) was also rated as good, although it was recommended that the instructions for assessing lower extremities be clarified. The clinicians liked the FSS (Part D), particularly the specific list of activities and breakdown of activities for computer use and cooking. It was suggested that "writing" be added to the list of activities, as this is one of the most common areas of difficulty for people with tremor. Except for the TSS, the clinicians felt that the MAT was easy to administer and score. The clinicians' recommendations were implemented before beginning Stage 2.

Stage 2

Ten people with MS participated in the study, and none dropped out. All participants experienced postural, intention, essential, and/or task-related tremor. Details on the demographic characteristics of the participants are given in Table 3.

Reliability

Test-retest reliability was examined for the TSS (Part C), the FSS (Part D), and the TIS and was found to be excellent for each (Table 4).

Inter-rater reliability was tested for the TSS (Part C), the only aspect of the MAT other than the interview

Table 3. Demographic characteristics of participants with multiple sclerosis (n = 10)

Characteristic	Value
Gender, No. (%)	
Female	7 (70)
Male	3 (30)
Age, y	
Mean \pm SD	49.7 \pm 9.7
Range	37–67
Handedness, No. (%)	
Right	9 (90)
Left	1 (10)
Mobility, No. (%)	
Wheelchair use	7 (70)
No wheelchair use	3 (30)
Course of disease	
Relapsing-remitting	3 (30)
Secondary progressive	0
Primary progressive	1 (10)
Progressive relapsing	4 (40)
Unknown	2 (20)
EDSS score, No. (%)	
1.0–3.0	0
3.5–4.5	1 (10)
5.0–5.5	0
6.0–6.5	3 (30)
7.0–8.0	3 (30)
8.5–9.5	0
Unknown	3 (30)

Abbreviations: EDSS, Expanded Disability Status Scale; SD, standard deviation.

that is administered by a professional, and was found to be excellent (Table 4).

Criterion Validity

Criterion validity was examined for the TSS (Part C) and the FSS (Part D). A statistically significant correlation was found between the TSS and the WHIGET, suggesting good criterion validity (Table 5). Correlation of the TSS to the FAHN showed fair criterion validity. Correlation of the FSS to the WHIGET and the TEMPAs showed moderate and poor criterion validity, respectively. A significant correlation was found between the FSS and the TADL, however, suggesting good criterion validity (Table 5).

Clinical Utility

Good clinical utility for the MAT was established based on feedback from three sources: the clinician participants, the MS participants, and the two researchers administering the MAT. The clinician feedback was reported above. Feedback from participants with MS and the researchers was based on the revised version of

Table 4. Inter-rater and test-retest reliability

Reliability	ICC (1,1)	95% CI	Cronbach α	P value
Inter-rater	0.98	0.92-0.99	0.99	.001
Test-retest				
TSS	0.87	0.57-0.97	0.93	.001
FSS	0.89	0.62-0.97	0.94	.001
TIS	0.92	0.72-0.98	0.96	.001

Abbreviations: CI, confidence interval; FSS, Functional Severity Scale; ICC, intraclass correlation coefficient; TIS, Tremor Impact Score; TSS, Tremor Severity Scale.

the MAT according to the clinician feedback. Parts A, B, and C were satisfactory, with criticism focused on Part D, the FSS. Participants rated their functional abilities based not on tremor alone but on all of their MS symptoms, as it was difficult to distinguish between the effects of various symptoms. In addition, participants were confused by the FSS rating scale, which broke down each numerical score into “difficulty to complete the activity” and “the percentage of time they experience impairment when trying to complete the activity” due to tremor. Participants were asked to rate the activity according to difficulty alone. Moreover, many participants commented that they did not understand how their tremor would affect “religious/spiritual” activity. This category was subsequently deleted.

The researchers found that the MAT took about 20 minutes to administer; this was deemed reasonable for an in-depth assessment, especially given their limited previous experience in assessing tremor. This finding was consistent with the observations of the clinician participants, further supporting the clinical utility of the instrument. The MAT is shown in Appendix 1.

Table 5. Criterion validity

Assessment	Spearman ρ	P value	Level of criterion validity
TSS vs. WHIGET	0.73	0.02 ^a	Good
TSS vs. FAHN	0.43	0.22	Fair
FSS vs. WHIGET	0.61	0.06	Moderate
FSS vs. TEMPAs	0.04	0.92	Poor
FSS vs. TADL	0.68	0.03 ^a	Good

Abbreviations: FAHN, Fahn Tremor Rating Scale; FSS, Functional Severity Scale; TADL, Tremor Activity of Daily Living Questionnaire; TEMPAs, Upper Extremity Performance Evaluation Test for the Elderly; TSS, Tremor Severity Scale; WHIGET, Washington Heights–Inwood Genetic Study of Essential Tremor.

^aP \leq .05.

Discussion

Valid and reliable instruments for assessing tremor in MS patients are needed in order to develop effective interventions.⁷ The MAT, one of the first multidimensional tools for assessing tremor in MS, was found in this study to have excellent inter-rater reliability and test-retest reliability, moderate criterion validity, and satisfactory clinical utility.

The inter-rater reliability correlation coefficient for the MAT was very high, with a narrow confidence interval, reflecting a strong likelihood that the sample mean would match the true population mean. The two researchers' lack of training in using the MAT and their limited previous experience assessing tremor in MS patients further bolsters this finding. The fact that numerous clinicians can use the MAT to assess MS patients and obtain the same results is clinically significant, as it is important for clinicians in different areas of practice who are assessing the same client to obtain accurate and consistent results.

Although test-retest reliability was excellent, the confidence intervals for the TSS and FSS were wide. This result may have several explanations. First, the sample size was small; a larger sample size may have increased the statistical significance of the findings, thus narrowing the confidence interval. Moreover, test-retest reliability might not be as strong as inter-rater reliability because tremor, like many other MS symptoms, varies from day to day and depends on numerous factors. Location was consistent between the two assessment times for all but one participant and thus is not likely to be a factor in the wide confidence interval. This particular participant also had the longest time span between the two assessments. Despite this one outlier, the MAT's good test-retest reliability demonstrates its consistency as a clinical tool and its ability to be used as an outcome measure. This is an important attribute of the tool given the variability of the MS disease process and symptom experience.

Criterion validity was established by correlating the TSS with the FAHN and WHIGET and the FSS with the WHIGET, TEMPA, and TADL. The TSS and the WHIGET were well correlated, supporting the MAT's criterion validity. Both measures are administered and scored by clinicians and include finger-to-nose testing and task-related tremor assessment. These similarities probably contributed to their strong correlation. The correlation between the TSS and the FAHN was fair. A stronger correlation between these two measures was

expected because development of the TSS was based on the FAHN. The results of the two measures were the same for test items that were similar, including head, trunk, and upper-extremity postural tremor and upper-extremity intention tremor. The results of the test items that differed, however, varied between the two measures, reducing the MAT's criterion validity. This variance may be explained by the fact that the FAHN was originally created to measure tremor in Parkinson's disease. The aspects of the FAHN that were adapted to be relevant to MS-associated tremor were not expected to correlate with those relevant for tremor in Parkinson's disease.

The correlation between the FSS and the WHIGET was moderate and approached statistical significance. Both measures allowed participants to use compensatory strategies to perform the functional task, and most of the items on the WHIGET were also included on the FSS. The correlation between the FSS and the TEMPA was poor, with no statistical significance found. This result may be due to several factors. First, the format of the two tests differed. Second, the TEMPA examines one-time performance, while the FSS measures average performance in daily life. This is important, as MS is a variable condition, and functional ability may fluctuate over the course of a day and from one day to the next. Third, the TEMPA evaluates participants' upper-extremity tremor by assessing both unilateral and bilateral functional tasks. The FSS measures participants' ability to perform tasks involving the upper and lower extremities and does not break the tasks down into unilateral and bilateral. This affected the scoring, because in the TEMPA the participant's tremor was rated worse if he or she could not perform an activity with a particular hand, whereas the FSS allowed the use of any compensa-

PracticePoints

- The Multidimensional Assessment of Tremor (MAT) is a new instrument designed for the comprehensive assessment of tremor associated with MS.
- The MAT has excellent inter-rater and test-retest reliability, good clinical utility, and moderate-to-good criterion validity.
- This new tool shows promise in helping clinicians effectively assess tremor in MS and design interventions to limit its negative effects on functioning.

tory strategy, including using the better hand or both hands to perform the activity. Finally, the TEMPAs list of activities was quite specific, whereas the FSS featured broad categories of activity.

The correlation between the FSS and the TADL was good, supporting the MAT's criterion validity. It was hypothesized that these measures would be correlated given that both are subjective self-report questionnaires investigating individuals' abilities to perform various activities of daily living. Although many of the activities included in the TADL were more specific than those included in the FSS, many others were the same.

This study had several limitations. First, all MS participants were from one MS clinic, resulting in a sample selection bias. In addition, the small size of the sample limits the generalizability of the results. Furthermore, because of the lack of other MS-specific tools to assess tremor, testing against "gold standard" assessments was difficult. Because MS is heterogeneous, future research to test the clinicometrics of the MAT should involve larger sample sizes. Further testing of the revised MAT by clinicians and examination of the instrument's construct validity is needed.

Conclusion

The results of this cohort study suggest that the MAT is a reliable, valid, and clinically useful tool for the comprehensive assessment of tremor associated with MS. It allows a holistic evaluation of the impact of tremor on the daily functioning of an individual with MS. The MAT shows promise as a tremor assessment tool that can effectively inform clinical reasoning and facilitate intervention planning. □

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ROBERT M. HERNDON IJMCS AWARD

The Consortium of Multiple Sclerosis Centers (CMSC) presents an annual award, the Robert M. Herndon IJMCS Award, for the best article published in the *International Journal of MS Care* during the preceding calendar year. Preference is given to articles that are based on data presented at an annual CMSC meeting. The award carries a \$1000 stipend. Robert M. Herndon was the founding editor of IJMCS and currently serves as Editor Emeritus. The winner of the 2010 award, for the best paper published in 2009, will be announced at the 2010 Annual Meeting of the CMSC in June.

Appendix A

MAT: A Multidimensional Assessment of Tremor

Date of Assessment: _____ Assessed By: _____

Client Name: _____

Client Goal #1: _____

Plan: _____

Client Goal #2: _____

Plan: _____

Client Goal #3: _____

Plan: _____

Summary

Tremor Severity Score: _____

Functional Severity Score: _____

Tremor Impact Score: _____

Tremor Impact Category: Low Moderate High

(A) Description of Tremor:

In what parts of the body do you experience tremor? (Check all that apply)

- Head Trunk Right UE Left UE Right LE Left LE

Is your tremor present throughout the day?

- Intermittent tremor Persistent tremor Other: _____

Are there any times during the day when your tremor is worse?

- Morning Afternoon Evening Other: _____

Do any of the following affect your tremor?

- Fatigue Stress or stressful events
 Heat Overstimulation Other: _____

Are there any activities that you find make your tremor worse?

- No Yes If yes: Which activities? _____

Are there any activities that you find make your tremor better?

- No Yes If yes: Which activities? _____

Briefly describe a typical day for yourself. Include daily routine.

(B) Psychosocial:

Do you ever feel down (depressed) due to your tremor?

- No Yes If yes: Does it stop you from engaging in activities? No Yes

Do you ever feel embarrassed by your tremor?

- No Yes If yes: Does it stop you from engaging in activities? No Yes

Do you ever feel frustrated by your tremor?

- No Yes If yes: How so? _____

Additional information and comments:

(C) Tremor Severity Scale¹:

	Postural	Intention	Task-Related	Subtotal
Head				
Trunk		-----	-----	
R Upper Limb				
L Upper Limb				
R Lower Limb				
L Lower Limb				

Scale: 0 – No tremor

1 – Slight tremor (amplitude <0.5 cm), may be intermittent

2 – Moderate tremor (amplitude 0.5-1 cm), may be intermittent

3 – Marked tremor (amplitude 1-2 cm)

4 – Severe tremor (amplitude 2+ cm)

Test Actions and Movements: See test instructions for full description

Head Tremor: a. Postural (observe tremor in head when sitting or standing) *ask client to sit still for a moment b. Intention (look up at ceiling and then down at floor) c. Task related (look over each shoulder at a specific target or object)	Trunk Tremor: a. Postural (observe tremor in trunk when sitting or standing) *ask client to sit still for a moment
Right Upper Limb a. Postural (arms outstretched in front with wrists mildly extended and fingers spread apart) b. Intention (finger-to-nose test) c. Task-related (reach for a pen placed at midline in front of client)	Left Upper Limb a. Postural (arms outstretched in front with wrists mildly extended and fingers spread apart) b. Intention (finger-to-nose test) c. Task-related (reach for a pen placed at midline in front of client)
Right Lower Limb a. Postural (legs flexed at hip and knees while sitting) *ask client to sit still b. Intention (move foot to touch target on floor approximately 8" in front or to side of client) c. Task-related (remove shoe and then slide foot into slipper or slip-on shoe)	Left Lower Limb a. Postural (legs flexed at hip and knees while sitting) *ask client to sit still b. Intention (move foot to touch target on floor approximately 8" in front or to side of client) c. Task-related (remove shoe and then slide foot into slipper or slip-on shoe)

¹ Modified from the Fahn, Tolosa & Marin 1988 scale

(D) Functional Severity Scale: Self-Report Scale

Evaluate the level of difficulty for you to perform each occupation listed. Use the scale from 0 to 4 shown below. If there are other things you do that are relevant to rate on this scale, please add these to the blank spaces provided in each section.

Scale:

- 0 – Can perform activity without difficulty
- 1 – Can perform activity with slight difficulty
- 2 – Can perform activity with moderate difficulty
- 3 – Can perform activity with considerable difficulty
- 4 – Can perform activity with extreme difficulty or cannot perform activity at all

Occupations	Score	Additional Information (optional)
Self-Care:		
*Dressing		
*Feeding		
*Bathing		
*Toileting		
*Grooming		
*Make-up or shaving		
*Brushing teeth		
*		
Productivity Activities:		
*Meal preparation – from scratch		
*Meal preparation – prepared foods		
*Housework		
*Shopping		
*Computer – Typing		
*Computer – Mouse use		
*		
Leisure Activities:		
*Eating out		
*Watching TV/Remote use		
*Social outings		
*Reading		
*Telephone use		
*Exercise		
*Hobbies		
*		
Other Activities:		
*Key in lock		
*Plug in socket		
*Insert CD/DVD		
*Handling money (bills and coins)		
*Using scissors		
*Writing		
*		
TOTAL SCORE		