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Reliability of the Fugl-Meyer Assessment for Testing Motor Performance in Patients Following Stroke

Background and Purpose. The purpose of this study was to establish the inter-rater reliability of assessments made with the Fugl-Meyer evaluation of physical performance in a rehabilitation setting. **Subjects.** Twelve patients (7 male, 5 female), aged 49 to 86 years ($\bar{X}=66$), who had sustained a cerebrovascular accident participated in the study. All patients were admitted consecutively to a rehabilitation center and were between 6 days and 6 months poststroke. **Methods.** Three physical therapists, each with more than 10 years of experience, assessed the patients in a randomized and balanced order using this assessment. The therapists standardized the assessment approach prior to the study but did not discuss the procedure once the study began. **Results.** The overall reliability was high (overall intraclass correlation coefficient=.96), and the intraclass correlation coefficients for the subsections of the assessment varied from .61 for pain to .97 for the upper extremity. **Conclusion and Discussion.** The relative merits of using the Fugl-Meyer assessment as a research tool versus a clinical assessment for stroke are discussed. [Sanford J, Moreland J, Swanson LR, et al. Reliability of the Fugl-Meyer assessment for testing motor performance in patients following stroke. *Phys Ther*. 1993;73:447-454.]

Julie Sanford
Julie Moreland
Laurie R Swanson
Paul W Stratford
Carolyn Gowland

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Stroke is a major cause of mortality and disability in many countries. The

average annual mortality rate for stroke per 100,000 people is 100.4 in

the United States, 116.2 in England and Wales, and 96.6 in Canada.¹ Data compiled from a number of surveys in the United States show that the annual incidence is approximately 100 to 150 per 100,000 people.¹ Following a stroke, patients usually receive intensive therapy to promote motor recovery and help them cope with their disability.

J Sanford, PT, is Research Coordinator, Rehabilitation Services, St Peter's Hospital, 88 Maplewood Ave, Hamilton, Ontario, Canada L8N 3Z5, and Assistant Clinical Professor, School of Occupational Therapy and Physiotherapy, Faculty of Health Sciences, McMaster University, 1200 Main St W, Hamilton, Ontario, Canada L8N 3Z5. Address all correspondence to Ms Sanford at the first address.

J Moreland, PT, is Physical Therapist, Physiotherapy Department, Chedoke-McMaster Hospitals, Chedoke Division, Hamilton, Ontario, Canada L8N 3Z5, and Clinical Lecturer, School of Occupational Therapy and Physiotherapy, Faculty of Health Sciences, McMaster University.

LR Swanson, PT, is Doctoral Candidate, Medical Sciences Program, McMaster University.

PW Stratford, PT, is Assistant Professor, School of Occupational Therapy and Physiotherapy, Faculty of Health Sciences, McMaster University.

C Gowland, PT, is Associate Professor, School of Occupational Therapy and Physiotherapy, Faculty of Health Sciences, McMaster University.

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Reliable and valid measurements of sensorimotor status are required for clinical decision-making and research purposes. One measure that has been extensively discussed is the Fugl-Meyer evaluation of physical performance.² The Fugl-Meyer assessment was developed to assess physical recovery following stroke. It was primarily developed from the earlier works of Twitchell³ and Brunnström.⁴

Twitchell examined the ontogenetic concept of motor recovery, through the assessment of sequenced reflex and synergistic patterned movements seen in patients recovering from stroke.³ Based on this recovery sequence, Brunnström identified six sequences of temporal, stepwise stages as a method of assessing motor recovery in patients with hemiplegia following stroke.⁴ In addition to motor performance, balance, sensation, range of movement, and pain are also assessed by the Fugl-Meyer items, which examine volitional movement within synergies, partially out of synergy, and independent of synergies.

The Fugl-Meyer motor assessment includes items dealing with the shoulder, elbow, forearm, wrist, and hand in the upper extremity and the hip, knee, and ankle in the lower extremity. Reflex activity is assessed in the upper and lower extremities at the beginning and end of the motor assessment. Balance is examined in sitting and standing. Sensation, evaluated by light touch, is examined on two surfaces in both the upper and lower extremities, and position sense (kinesthesia) and range of motion (ROM) are tested on eight joints, four in each extremity.²

The Fugl-Meyer assessment, which consists of 155 items, is an impairment measure. *Impairment* is defined as any loss or abnormality in psychological, physiological, or anatomical structure or function.⁵ With the Fugl-Meyer assessment, each item is rated on a three-point ordinal scale (2 points for the detail being performed completely, 1 point for the detail being performed partially, and 0 for the detail not being performed). The maximum score that can be attained is 226. The maximum motor performance score is 66 points for the upper extremity, 34 points for the lower extremity, 14 points for balance, 24 points for sensation, and 44 points each for passive joint motion and joint pain. Joint pain is assessed by moving the joint through its available ROM to assess whether pain occurs at any point in the range. Fugl-Meyer assigned motor function scores to

items that assessed motor function alone, with a total possible score of 100 points. Scores were grouped according to the various levels of impairment, which were as follows: <50 points=severe motor impairment, 50–84 points=marked motor impairment, 85–95 points=moderate motor impairment, and 96–99 points=slight motor impairment.⁶

The properties of this instrument have been described by various authors^{2,7–15} (Tab. 1). Most of these authors examined the validity of the instrument. In the original study by Fugl-Meyer et al,² 28 patients were assessed on five occasions during a 1-year period following stroke. The mean correlation coefficient between the upper- and lower-extremity scores was .88.² Other researchers compared scores from the Fugl-Meyer assessment with data from the Barthel Index^{10,11}; a Bobath assessment¹²; upper-extremity function tests⁹; and tests for balance in standing, walking performance, and postural stability.¹⁰ The correlation coefficients reported from these studies varied from .54 for the total score to .94 for the upper extremity, thus providing evidence of construct validity.

Studies to date have examined the construct validity of the Fugl-Meyer assessment in samples of chronically disabled patients following stroke. Less work has been done to determine the reliability of measurements obtained with this assessment. Duncan et al¹⁴ reported the interrater reliability of motor performance in the upper and lower extremities and the intrarater reliability of all subscores and the total Fugl-Meyer score using four physical therapists as evaluators. The 19 patients in their study were more than 1 year poststroke, with a mean time of 51 months since the onset of their stroke. Intrarater Pearson correlations for each subscore and the total score varied from .86 to .99. The interrater Pearson correlations for the motor scores of the upper and lower extremities varied from .79 to .99. Because Duncan et al studied subjects who were chronically disabled following stroke,

the generalizability of their results is limited to similar patient populations.

The study described in this report examined the overall interrater reliability and the reliability of each subsection of the Fugl-Meyer assessment, administered by three raters to patients undergoing active rehabilitation following stroke.

The purposes of our study were (1) to examine the interrater reliability of measurements obtained with the Fugl-Meyer assessment and (2) to determine the relevance of the assessment for clinical and research purposes. The specific aims of the study were to determine whether the Fugl-Meyer assessment is able to discriminate among patients when it is used to evaluate patients' motor recovery following stroke and to determine the magnitude of the measurement error for the total score and score of the subsections of the assessment. The a priori level of acceptable reliability among raters was set at an intraclass correlation coefficient (ICC[2,1]) of greater than .80 for the total score and subscores.

Method

This study was part of a larger study that examined the measurement properties of the Chedoke-McMaster Stroke Assessment.¹⁶

Subjects

Twelve patients consecutively admitted to the Chedoke-McMaster Rehabilitation Centre, Hamilton, Ontario, Canada, were each assessed by three therapists (see Tab. 2 for descriptions of the patients) on separate occasions. The Chedoke-McMaster Rehabilitation Centre is a tertiary care setting at which patients are treated on a daily basis by a multidisciplinary team. The average length of stay per patient was 10 weeks. Patients were included if they were less than 80 years of age, were less than 6 months poststroke, and gave their consent to participate in the study.

Table 1. Summary of Studies Examining Properties of the Fugl-Meyer Assessment

Study	Subjects and Methods	Type of Study	Results
Fugl-Meyer et al, ² 1975	28 patients Stroke for at least 24 hours Fugl-Meyer assessment administered at 6 weeks to 6 months 15 patients followed for 1 year	Content validity	Mean correlation coefficient between scores=.88 Fugl-Meyer assessment items were considered to be consistent with the recovery pattern observed
Badke and Duncan, ⁷ 1983	10 healthy subjects and 10 patients with right hemiparesis secondary to cerebrovascular accident Balance tests in standing	Construct validity	Correlation between abnormal postural adjustments made by lower extremity (LE) on balance platform and Fugl-Meyer assessment LE scores
De Weerdts and Harrison, ⁸ 1985	53 subjects Action Research Arm test and Fugl-Meyer assessment used at 2 weeks and 8 weeks poststroke	Construct validity	Spearman rho 2 weeks, $r=.91$ 8 weeks, $r=.94$ $P<.01$
Berglund and Fugl-Meyer, ⁹ 1986	10 patients with stroke and upper-extremity impairment Fugl-Meyer assessment and DeSouza functional arm test used to assess upper extremity	Construct validity	Fugl-Meyer assessment and DeSouza test total scores covaried closely, explaining more than 90% of the variance Motor assessments also closely associated, explaining more than 80% of the variance
Dettmann et al, ¹⁰ 1987	15 men following cerebrovascular accident tested using Barthel Index, Fugl-Meyer assessment, and tests of walking performance and postural stability using light photography	Construct validity	Pearson Product-Moment Correlation Coefficient $r=.75$, upper extremity $r=.74$, motor control $r=.76$, balance $r=.67$, total scores $P<.01$
Di Fabio and Badke, ¹⁵ 1990	10 patients assessed $\bar{X}=14.9$ weeks poststroke with sensory organization balance test and Fugl-Meyer assessment	Construct validity	Spearman rho $r=.55$, sensory $r=.77$, balance $r=.69$, lower extremity
Wood Dauphinee et al, ¹¹ 1990	172 patients assessed at admission and 5 weeks poststroke with Fugl-Meyer assessment and Barthel Index	Construct validity	Pearson Product-Moment Correlation Coefficient $r=.754$ at admission $r=.854$ at 5 weeks $P<.01$
Arsenault et al, ¹² 1988	62 subjects 3.1 months poststroke Treated with Bobath approach for 3 months and assessed three times Bobath evaluation and Fugl-Meyer assessment (wrist and hand not evaluated)	Fugl-Meyer assessment used as a reference measure	Spearman rho association between Bobath approach and Fugl-Meyer assessment at three times of testing $P<.001$ Analysis of variance Fugl-Meyer assessment cumulated with Bobath approach measurements $\chi^2=20.6$ ($P<.0001$)
Kusoffsky et al, ¹³ 1982	16 patients examined on six occasions with Fugl-Meyer assessment from subacute stage to 6 months poststroke (motor control, touch, joint position sense) and somatosensory evoked potentials (STEP) test	Criterion validity	Correlations highest in results from upper-extremity scores
Duncan et al, ¹⁴ 1983	19 subjects 1 year poststroke 4 physical therapists Physical therapists administered 3 tests at 3-week intervals	Reliability	Intrarater Pearson Product-Moment Correlation Coefficients $r=.86-.99$ Interrater upper extremity, $r=.97-.99$ Lower extremity, $r=.79-.95$ $P<.001$

Table 2. Description of Patients (N=12)

	No. of Patients	\bar{X}	SD	Range
Cause of cerebrovascular accident				
Infarction	11			
Unknown	1			
Time from onset to admission		56 d	30 d	6 d 6 mo
Gender				
Male	7			
Female	5			
Age (y)		66	11.47	49–86
Side of plegia				
Right	8			
Left	4			
Source of referral				
Acute care center	10			
Home	2			

Raters

Three physical therapists who had between 10 and 20 years of experience in stroke rehabilitation administered the assessment. They reviewed the original article by Fugl-Meyer et al² and designed a form to record the results (Appendix). Prior to commencing the study, the physical therapists discussed the assessment and tested three patients. Each therapist performed and rated one assessment while the other therapists rated the patient's responses. They compared their results after each assessment. Approximately 2½ hours was spent in this preparation.

Design

The order in which the therapists saw the patients was randomized and balanced (equal numbers of subjects were assigned to the therapists). All patients were tested within one working day of the previous assessment (ie, theoretically, there should have been no change in the patients) and were seen on only one occasion by each therapist; that is, each patient was assessed by all three physical therapists on separate occasions. Assessments took approximately 30 minutes to administer. After the study

began, the therapists did not discuss the results of the assessments.

Data Analysis

Descriptive statistics, including the mean and standard deviation for the total Fugl-Meyer score and for the subscores, were calculated for each rater and for each testing occasion. A three-way analysis of variance (ANOVA) was performed to test for differences between raters (three levels) and occasions (three levels). The third factor in the analysis was subjects (ie, subjects \times raters \times occasions). Differences were formally tested by calculating the *F* statistic and the associated probability value. The level of statistical significance was set at .05. Reliability was assessed by calculating an ICC (type 2,1), a random-effects model described by Shrout and Fleiss.¹⁷ *Reliability* is defined as the ability of an instrument to measure attributes in a reproducible and consistent manner.¹⁸

A measurement is considered to be consistent if it produces similar results over a number of occasions in a stable situation.¹⁹ The ICC used to calculate the reliability coefficients represents the ratio of variance due to subjects compared with the total vari-

ance; thus, its most direct interpretation relates to its ability to discriminate among patients. It is directly reliant on the heterogeneity of the patients. Ninety-five percent confidence limits were calculated to determine the precision of the estimate of reliability.²⁰ Calculating the reliability of an assessment also involves calculating the variability in an individual's score due to factors irrelevant to the purpose of the test. This variability is known as the *error of measurement*.^{20,21} The standard error of measurement (SEM) was calculated from an error term that combined rater, occasion, and error variances.¹⁸

Results

The summary statistics (means and standard deviations) for both time and rater are shown in Tables 3 and 4. The ANOVA did not reveal any statistically significant systematic differences attributable to raters or occasions. The overall mean scores of the raters varied from 161 to 167 points. All raters had a mean score of 40 points for the upper extremity. The sensation subsection had the greatest difference between means, a 3-point difference. The mean total scores according to occasion varied from 162 to 165 points, with the largest difference between the means in any section being 2 points.

The ICCs, confidence limits, variance components, and SEMs are shown in Table 5. The interrater reliability for the total score was .96.

The reliability coefficients for the subsections of the Fugl-Meyer assessment varied from .61 for the pain measurements to .97 for the upper-extremity items (Tab. 5). The SEM was 9 points for the total score and varied from 1 for balance to 4 for pain. Table 5 provides the maximum total score for each section as a reference point for each of the SEMs.

The total scores for the patients varied from 79 to 220 points. Using the guidelines developed by Fugl-Meyer for characterizing the various levels of motor performance⁶ to analyze our

Table 3. Time Results

Component	Maximum Score	Occasion 1		Occasion 2		Occasion 3	
		\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Total Fugl-Meyer assessment score	226	166	49	162	49	165	47
Upper extremity	66	41	24	41	24	39	23
Lower extremity	34	23	12	21	11	22	11
Balance	14	8	3	8	8	8	4
Sensation	24	18	8	18	8	18	9
Range of motion	44	38	6	39	5	39	5
Pain	44	38	4	37	8	38	5

results, we found that 92% of the patients in our study were in the first three categories (severe impairment, $n=3$; marked impairment, $n=4$, and moderate impairment, $n=4$). Only one patient had scores that would indicate slight motor impairment.

Discussion

Overall, the reliability estimates in our study were similar to those reported by Duncan et al ($r=.86-.99$)¹⁴ and Di Fabio and Badke ($\rho=.95$).¹⁵ In our study, the reliability coefficient for the upper extremity was higher than that for the lower extremity. Recovery of function often occurs faster and to a greater extent in the lower extremity than in the upper extremity. Therefore, many of the patients may have been unable to perform components

of the upper-extremity assessment, reducing the possibility of rater error. Most patients were able to perform almost all of the lower-extremity items. The lower-extremity performance may have been less consistent from day to day, which may account for a relatively greater amount of residual error. The relative heterogeneity of the scores for the upper limb may account for the higher reliability coefficient for the upper extremity compared with the lower extremity.

Pain assessment was the least reliable section. This finding may be due to the natural (random) variation in pain from day to day or to variation of rater interpretation of the patients' pain. Although sensation had a reasonable degree of reliability ($ICC=.86$), it had the greatest variance

due to rater error. The rater is reliant on the patient's verbal ability to describe his or her perceptions. This is in contrast to other items in the Fugl-Meyer assessment, which involve scoring through direct observation.

There was very little variation in the measurements attributable to occasion. The small variances associated with rater and occasion (Tab. 5) demonstrate the absence of systematic differences related to these variables.

The main component of the assessment is motor recovery following stroke. The inclusion of sections to assess range of movement and pain allows for the assessment of impairments that may be attributed to causes other than the stroke. The impairment measures of the Fugl-Meyer assessment have been shown to correlate with activities of daily living (ADL) measures ($r=.92$).²² This finding suggests that patients with similar scores on the impairment measures of the Fugl-Meyer assessment will also have similar scores on ADL measures. Because sensation has been noted as a predictor of sensorimotor recovery,²³ assessment of this area by the Fugl-Meyer assessment increases the strength of the tool.

The SEM provides an interpretation of the magnitude of measurement error and is more appropriate than the reliability coefficient for interpreting individual scores.²¹ One standard error encompasses 68% of obtained scores around the true score, and a standard error of 1.96 encompasses 95% of obtained scores. The SEM for the Fugl-Meyer assessment is 9.4 points, and the 95% confidence interval would be ± 18 points. Given that a clinician obtains a total score of 150 points for the overall observed total score at the 95% confidence level with any single administration of the test, the score obtained will lie between 140.6 and 159.4 points.

In order to evaluate change in an individual patient, Ottenbacher et al²⁴ recommended that the "reliability change index" be used. The standard error of the difference is used to

Table 4. Rater Results

Component	Maximum Score	Rater 1		Rater 2		Rater 3	
		\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Total Fugl-Meyer assessment score	226	165	42	167	52	161	53
Upper extremity	66	40	23	40	24	40	24
Lower extremity	34	21	10	23	12	23	13
Balance	14	7	4	8	4	8	4
Sensation	24	17	6	20	8	17	9
Range of motion	44	39	4	39	6	38	6
Pain	44	39	4	37	6	37	8

Table 5. Analysis of Variance Results for Fugl-Meyer Assessment

	Variance Component				ICC ^a (95% CI) ^b	SEM ^c	Maximum Total Score
	Subject	Rater	Occasion	Error			
Total Fugl-Meyer assessment score	2,306	0.23	0	93	.96 (.91-.99)	9.4	226
Upper extremity	540	0.0	0	15	.97 (.94-.99)	3.6	66
Lower extremity	121	0.0	0	11.46	.92 (.81-.96)	3.2	34
Balance	12	0.0	0	1.26	.93 (.82-.97)	1.0	14
Sensation	55	1.5	0	8	.85 (.67-.94)	2.9	24
Range of motion	23	0.08	0	4	.85 (.67-.94)	2.0	44
Pain	23	0.0	0	15	.61 (.29-.85)	3.7	44

^aICC=intraclass correlation coefficient.^bCI=confidence interval.^cSEM=standard error of the measurement.

determine whether the change score exceeds the score that would be expected on the basis of measurement error. Given that no true change occurred 95% of the time, the score obtained by a second rater at a different point in time would be within ± 26 points ($13 \times 1.96 \times 2$)²⁴ of the score of the first rater. This difference represents about 11.5% of the maximum possible score. On the basis of this result, the Fugl-Meyer assessment is a moderately reliable tool. In our study, evaluation using the instrument involved more than one therapist; thus, both the reliability coefficients and the SEMs are conservative estimates compared with the situation of a single assessment by a therapist.

How can these results be interpreted by a therapist in a clinical setting? The results of this study indicate the reliability and the SEM that would likely be obtained among several raters with a similar patient population in a clinical setting. If two clinicians assessed a patient who was receiving active rehabilitation following a stroke (ie, simi-

lar to the patients in our sample) on different occasions using the Fugl-Meyer assessment and derived total scores that were 10 points apart, we would not be sure whether true change had occurred or whether the difference in scores was due to rater or residual error. Although the assessment of intrarater reliability was not part of our study, we would expect it to be equal to or greater than the interrater reliability coefficient. Fugl-Meyer et al² reported scores of 13 patients they assessed on five occasions over a 12-month period. Patients' total scores from time 1 to time 5 improved from 7 to 83 points on the assessment, with the average change for the group calculated at 43.08 points (SD=29.13). If a large amount of "true" change occurs, then a SEM of 9.4 points is acceptable. If smaller change in the patient occurs, however, the magnitude of the error may be unacceptable. Error can be reduced by averaging over raters or occasions when change is not occurring. By increasing the raters or occasions on which a patient is assessed,

the SEM would be reduced, as the error would be averaged across raters or occasions.¹⁶

The Fugl-Meyer assessment is well suited as a research tool because it is relatively easy to establish a high degree of reliability among several raters. In a clinical or research setting, standardization needs to be considered prior to using this assessment. A limitation of this assessment is the lack of administration guidelines. One strategy for reducing the measurement error is to standardize the administration guidelines of this assessment.

Anastasi²¹ suggests that separate reliability coefficients should be reported for the sample subgroups, as the coefficients obtained are more likely to be applicable to clinical practice. Our sample was too small to calculate tight confidence limits for the reliability coefficients for subgroups, but this would be a worthwhile direction for further study.

Conclusions

The Fugl-Meyer assessment is designed to assess motor recovery following stroke. The interrater reliability of measurements obtained with this assessment was tested by three experienced physical therapists on 12 patients in a rehabilitation population. It is a relatively simple assessment to administer and requires minimal training. The overall reliability for this instrument was high (ICC=.96), as were the reliability measurements for the subsections of this assessment, with the exception of pain. Error measured in absolute terms may be significant, however, when only small changes in the patient's level of motor performance are expected. These results would suggest that the Fugl-Meyer assessment is a moderately reliable measure for assessing impairment in a population of patients undergoing rehabilitation following stroke.

Appendix. Fugl-Meyer Assessment Score Sheet

Patient's Name _____	Patient No. _____
Therapist's Name _____	Date _____

UPPER EXTREMITY

A. Shoulder/Elbow/Forearm

I. Reflex activity

Flexors —Biceps ☐

 —Finger flexors ☐

Extensors—Triceps ☐

II. a. Flexor synergy

Shoulder—Retraction ☐

 —Elevation ☐

 —Abduction ☐

 —Outward rotation ☐

Elbow —Flexion ☐

Forearm —Supination ☐

b. Extensor synergy

Shoulder—Adduction/inward rotation ☐

Elbow —Extension ☐

Forearm —Pronation ☐

III. Hand to lumbar spine

Hand —Move to lumbar spine ☐

Shoulder —Flexion 0°–90° ☐

Elbow 90°—Pronation/supination ☐

IV. Shoulder —Abduction 0°–90° ☐

 —Flexion 90°–180° ☐

Elbow 0° —Pronation/supination ☐

V. Normal reflex activity ☐

Total—Shoulder/Elbow/Forearm ☐

B. Wrist

Elbow 90°—Wrist stability ☐

Elbow 90°—Wrist flexion/extension ☐

Elbow 0° —Wrist stability ☐

Elbow 0° —Wrist flexion/extension ☐

Circumduction ☐

Total—Wrist ☐

C. Hand

Fingers mass flexion ☐

Fingers mass extension ☐

Grasp a ☐

Grasp b ☐

Grasp c ☐

Grasp d ☐

Grasp e ☐

Total—Hand ☐

D. Coordination/Speed

Tremor ☐

Dysmetria ☐

Speed ☐

Total—Coordination/Speed ☐

Total Motor Score for the Upper Extremity ☐

LOWER EXTREMITY

E. Hip/Knee/Ankle

I. Reflex activity

Flexors —Hamstrings ☐

 —Achilles ☐

Extensors—Patellar ☐

II. a. Flexor synergy

Hip —Flexion ☐

Knee—Flexion ☐

Ankle—Dorsiflexion ☐

b. Extensor synergy

Hip —Extension ☐

 —Adduction ☐

Knee—Extension ☐

Ankle—Plantar flexion ☐

III. Knee—Flexion ☐

Ankle—Dorsiflexion ☐

IV. Knee—Flexion ☐

Ankle—Dorsiflexion ☐

V. Normal reflex activity

Flexors —Hamstrings ☐

 —Achilles ☐

Extensors—Patellar ☐

Total—Hip/Knee/Ankle ☐

F. Coordination/Speed

Tremor ☐

Dysmetria ☐

Speed ☐

Total—Coordination/Speed ☐

Total Motor Score for the Lower Extremity ☐

G. Balance

Sit without support ☐

Parachute reaction, nonaffected side ☐

Parachute reaction, affected side ☐

Supported standing ☐

Standing without support ☐

Stand on nonaffected leg ☐

Stand on affected leg ☐

Total Score—Balance ☐

H. Sensation

a. Light touch

Arm ☐

Palm ☐

Leg ☐

Plantar ☐

(continued)

Appendix. (continued)

b. Position				Motion/Pain	
Shoulder	<input type="checkbox"/>	Hip	Flexion	<input type="checkbox"/>	<input type="checkbox"/>
Elbow	<input type="checkbox"/>		Abduction	<input type="checkbox"/>	<input type="checkbox"/>
Wrist	<input type="checkbox"/>		Outward rotation	<input type="checkbox"/>	<input type="checkbox"/>
Thumb (interphalangeal)	<input type="checkbox"/>		Inward rotation	<input type="checkbox"/>	<input type="checkbox"/>
Hip	<input type="checkbox"/>	Knee	Flexion	<input type="checkbox"/>	<input type="checkbox"/>
Knee	<input type="checkbox"/>		Extension	<input type="checkbox"/>	<input type="checkbox"/>
Ankle	<input type="checkbox"/>	Ankle	Dorsiflexion	<input type="checkbox"/>	<input type="checkbox"/>
Great toe	<input type="checkbox"/>		Plantar flexion	<input type="checkbox"/>	<input type="checkbox"/>
Total Score—Sensation	<input type="checkbox"/>	Foot	Pronation	<input type="checkbox"/>	<input type="checkbox"/>
I. Passive Joint Motion/Joint Pain			Supination	<input type="checkbox"/>	<input type="checkbox"/>
	Motion/Pain	Total Score—Passive Joint Motion/Joint Pain		<input type="checkbox"/>	<input type="checkbox"/>
Shoulder	Flexion	<input type="checkbox"/>	<input type="checkbox"/>	SUMMARY	
	Abduction >90°	<input type="checkbox"/>	<input type="checkbox"/>	A. Shoulder/Elbow/Forearm	<input type="checkbox"/>
	Outward rotation	<input type="checkbox"/>	<input type="checkbox"/>	B. Wrist	<input type="checkbox"/>
	Inward rotation	<input type="checkbox"/>	<input type="checkbox"/>	C. Hand	<input type="checkbox"/>
Elbow	Flexion	<input type="checkbox"/>	<input type="checkbox"/>	D. Coordination/Speed	<input type="checkbox"/>
	Extension	<input type="checkbox"/>	<input type="checkbox"/>	Total Upper Extremity	<input type="checkbox"/>
Forearm	Pronation	<input type="checkbox"/>	<input type="checkbox"/>	E. Hip/Knee/Ankle	<input type="checkbox"/>
	Supination	<input type="checkbox"/>	<input type="checkbox"/>	F. Coordination/Speed	<input type="checkbox"/>
Wrist	Flexion	<input type="checkbox"/>	<input type="checkbox"/>	Total Lower Extremity	<input type="checkbox"/>
	Extension	<input type="checkbox"/>	<input type="checkbox"/>	G. Balance	<input type="checkbox"/>
Fingers	Flexion	<input type="checkbox"/>	<input type="checkbox"/>	H. Sensation	<input type="checkbox"/>
	Extension	<input type="checkbox"/>	<input type="checkbox"/>	I. Passive Joint Motion/Joint Pain	<input type="checkbox"/> M <input type="checkbox"/> P
				TOTAL SCORE	<input type="checkbox"/>

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Julie Sanford, Julie Moreland, Laurie R Swanson, Paul W Stratford and Carolyn Gowland
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