

Fugl-Meyer Assessment Upper Extremity

Patient Initials _____ Team _____

A. Upper Extremity (sitting)		Date	Evaluation	Re-test	Re-test	Re-test	Re-test
I. Reflex Activity 0=No Reflex 2= Reflex activity	Biceps						
	Triceps						
Subtotal I (Max 4)							
II. Voluntary Movement within synergy 0= cannot be performed at all 1= partial 2= full							
Flexor synergy: Hand from contralateral knee to ipsilateral ear. From extensor synergy (shoulder adduction/ internal rotation, elbow extension, forearm pronation) to flexor synergy (shoulder abduction/ external rotation, elbow flexion, forearm supination).	Shoulder	Retraction					
		Elevation					
		Abduction (90°)					
		External Rotation					
	Elbow	Flexion					
	Forearm	Supination					
Extensor synergy: Hand from ipsilateral ear to the contralateral knee	Shoulder	Adduction/ Internal rotation					
		Elbow	Extension				
	Forearm	Pronation					
		Subtotal II (max 18)					
III. Voluntary Movement Mixing Synergies							
Hand to Lumbar Spine	0=Cannot be performed hand in front of ASIS 1= hand behind ASIS (without compensation) 2= hand to lumbar spine						
Shoulder Flexion 0°- 90° Elbow at 0° Pronation-supination 0°	0= immediate abduction or elbow flexion 1=supination or elbow flexion during movement 2= abduction 90°, maintains 0° at elbow						
Pronation-supination Elbow at 90° Shoulder at 0°	0= no pronation/supination, starting position impossible 1= limited pronation/supination, maintains position 2= complete pronation/supination, maintains position						
Subtotal III (max 6)							

IV. Voluntary isolated movements (little or no synergy)

	Date	Evaluation	Re-test	Re-test	Re-test	Re-test
Shoulder abduction 0-90° Elbow at 0° Forearm pronated	0= immediate supination or elbow flexion 1= supination or elbow flexion during movement 2= abduction to 90°					
Shoulder flexion 90° -180° Elbow at 0° Pronation-supination 0°	0=immediate abduction or elbow flexion 1= abduction or elbow flexion during movement 2= complete flexion maintains 0° in elbow					
Pronation/supination Elbow 0° Shoulder at 30° – 90° flexion	0= not pronation/supination, starting position impossible 1= limited pronation/supination, maintains extension 2= full pronation/supination, maintains elbow extension					
Subtotal IV (max 6)						

V. Normal Reflex Activity (evaluated only if full score of 6 on part IV)

Biceps, triceps, finger flexors	0= zero points on part IV or 2-3 reflexes markedly hyperactive or at 1= one reflex markedly hyperactive or at least two reflexes lively 2= maximum of 1 reflex lively, none hyperactive					
Subtotal V (max 2)						
Total A (max 36)						

B. Wrist support may be provided at the elbow to take or hold position, no support at wrist, check PROM prior to testing		Evaluation date	Re-test	Re-test	Re-test	Re-test
Stability at 15° dorsiflexion Elbow at 90°, forearm pronated shoulder at 0°	0= less than 15° active dorsiflexion 1= dorsiflexion 15°, no resistance 2= maintains position against resistance					
Repeated dorsiflexion / volar flexion elbow at 90°, forearm pronated shoulder at 0°, slight finger flexion	0=cannot perform volitionally 1=limited active range of motion 2= full active range of motion, smoothly					
Stability at 15° dorsiflexion elbow at 0°, forearm pronated slight shoulder flexion/abduction	0= less than 15° active dorsiflexion 1= dorsiflexion 15°, no resistance 2= maintains position against resistance					
Repeated dorsiflexion /volar flexion elbow at 0°, forearm pronated slight shoulder flexion/abduction	0= cannot perform volitionally 1= limited active range of motion 2= full active range of motion, smoothly					
Circumduction	0=cannot perform volitionally 1= jerky movement or incomplete 2=complete and smooth circumduction					
Total B (max 10)						

C. HAND support may be provided at the elbow to keep 90° flexion, no support at the wrist, compare with unaffected hand, the objects are interposed, active grasp		Evaluation date	Re-test	Retest	Re-test	Re-test
Mass flexion from full active or passive extension	0= none 1= partial 2= full					
Mass extension from full active or passive flexion	0= none 1= partial 2= full					
Grasp						
A – flexion in PIP and DIP (digits II-V) extension in MCP II-V	0=cannot be performed 1= can hold position but weak 2=maintains position against resistance					
B – thumb adduction 1-st CMC, MCP, IP at 0°, scrap of paper between thumb and 2-nd MCP joint	0=cannot be performed 1=can hold paper but not against tug 2= can hold paper against a tug					
C – opposition pulpa of the thumb against the pulpa of 2-nd finger, pencil, tug upward	0=cannot be performed 1= can hold pencil but not against tug 2= can hold pencil against a tug					
D – cylinder grip cylinder shaped object (small can) tug upward, opposition in digits I and II	0=cannot be performed 1=can hold cylinder but not against tug 2=can hold cylinder against a tug					
E – spherical grip fingers in abduction/flexion, thumb opposed, tennis ball	0=cannot be performed 1=can hold ball but not against tug 2= can hold ball against a tug					
Total C (max 14)						

D. COORDINATION/SPEED after one trial with both arms, blind-folded, tip of the index finger from knee to nose, 5 times as fast as possible		Evaluation	Re-test	Re-test	Re-test	Re-test
Tremor	0= marked 1= slight 2= none					
Dysmetria	0= marked 1= slight 2= none					
Time	0= more than 5 seconds slower than unaffected side 1= 2-5 seconds slower than unaffected side 2= maximum difference of 1 second between sides					
Total D (max 6)						
Clinical change = 5 points, Severe impairment <19, Mild impairment >50						
Total A-D (max 66)						

LOWER EXTREMITY (supine)	I. Reflex activity—tested in supine position. Achilles _____ Patellar _____	0—No reflex activity 2—Reflex activity	4
Supine	II. a. Flexor Synergy Hip flexion _____ Knee flexion _____ Ankle dorsiflexion _____ b. Extensor synergy—(motion is resisted) Hip extension _____ Adduction _____ Knee extension _____ Ankle plantarflexion _____	a. 0—Cannot be performed 1—Partial motion 2—Full motion b. 0—No motion 1—Weak motion 2—Almost full strength compared to normal	6 8
SITTING (knees free of chair)	III. Movement Combining Synergies a. Knee flexion beyond 90° _____ b. Ankle dorsiflexion _____	a. 0—No active motion 1—From slightly extended position knee can be flexed but not beyond 90° b. 0—No active flexion 1—Incomplete active flexion 2—Normal dorsiflexion	4
STANDING	IV. Movement Out of Synergy Hip at 0° a. Knee flexion _____ b. Ankle dorsiflexion _____	a. 0—Knee cannot flex without hip flexion 1—Knee begins flexion without hip flexion, but doesn't get to 90°, or hip flexes during motion 2—Full motion as described b. 0—No active motion 1—Partial motion 2—Full motion	4
SITTING	V. Normal Reflexes Knee flexors _____ Patellar _____ Achilles _____	0—2 of the 3 are markedly hyperactive 1—One reflex is hyperactive or 2 reflexes are lively 2—No more than 1 reflex lively	2
(SUPINE)	VI. Coordination/Speed Heel to opposite knee (5 repetitions in rapid succession) a. Tremor _____ b. Dysmetria _____ c. Speed _____	a. 0—Marked tremor 1—Slight tremor 2—No tremor b. 0—Pronounced or unsystematic 1—Slight or systematic 2—No dysmetria c. 0—Six seconds slower than unaffected side 1—Two to 5 seconds slower 2—Less than 2 seconds difference	6
		TOTAL MAXIMUM LOWER EXTREMITY SCORE	34

ACTION

Patient Name: _____

RESEARCH

Rater Name: _____

ARM TEST

Date: _____

Instructions There are four subtests: Grasp, Grip, Pinch, Gross Movement. Items in each are ordered so that:

- if the subject passes the first, no more need to be administered and he scores top marks for that subtest;
- if the subject fails the first *and* fails the second, he scores zero, and again no more tests need to be performed in that subtest;
- otherwise he needs to complete all tasks within the subtest

Activity Score

Grasp 1. Block, wood, 10 cm cube (If score = 3, total = 18 and to Grip) _____ Pick up a 10 cm block

2. Block, wood, 2.5 cm cube (If score = 0, total = 0 and go to Grip) _____ Pick up 2.5 cm block

3. Block, wood, 5 cm cube _____

4. Block, wood, 7.5 cm cube _____

5. Ball (Cricket), 7.5 cm diameter _____

6. Stone 10 x 2.5 x 1 cm _____

Coefficient of reproducibility = 0.98

Coefficient of scalability = 0.94

Grip 1. Pour water from glass to glass (If score = 3, total = 12, and go to Pinch) _____

2. Tube 2.25 cm (If score = 0, total = 0 and go to Pinch) _____

3. Tube 1 x 16 cm _____

4. Washer (3.5 cm diameter) over bolt _____

Coefficient of reproducibility = 0.99

Coefficient of scalability = 0.98

Pinch 1. Ball bearing, 6 mm, 3rd finger and thumb (If score = 3, total = 18 and go to Grossmt) _____

2. Marble, 1.5 cm, index finger and thumb (If score = 0, total = 0 and go to Grossmt) _____

3. Ball bearing 2nd finger and thumb _____

4. Ball bearing 1st finger and thumb _____ (video)

5. Marble 2nd finger and thumb _____ (video)

6. Marble 1st finger and thumb _____

Gross Movement

1. Place hand behind head (If score = 3, total = 9 and finish) _____
2. (If score = 0, total = 0 and finish _____
3. Place hand on top of head _____
4. Hand to mouth _____

Table A2: Suggested Test Materials Used in Performing the Arm Motor Ability Test

AMAT Testing Materials & Measurements

Task	Item Measurements
Cut meat task	<p>Knife: 20.2 cm length (7.9 inches) Fork: 17.8 cm length (7.0 inches) Meat: 5.1 cm x 7.6 cm x 1.3 cm (2 inches x 3 inches x 0.5 inches) (Pre-drawn lines divide the square into two 1 inch (2.5 cm) areas and one 2 inch (5.1 cm) area Jar of play-doh (any color)</p>
Pick up “sandwich” task	<p>Piece of sponge measuring: 10.2 cm x 7.6 cm (4 inches x 3 inches) Plate: 26 cm (10.5 inches) in diameter 81.6 cm (32.3 inches) circumference Dycem under the plate: 19.1 cm (7.6 inches) diameter 61.4 cm (24.3 inches) circumference</p>
Eat with spoon task	<p>Spoon: 15.4 cm (6.1 inches) length Bowl: 15.2 cm (6.0 inches) diameter 45.4 cm (17.8 inches) circumference Kidney Bean: (need 3 for the task) 1.2 cm (.5 inches) length 0.8 cm (.03 inches) width</p>
Comb hair task	<p>Comb brand: Scunci Comb: 24.7 cm (9.7 inches) length 6.0 cm (2.4 inches) width (teeth area of comb) 2.1 cm (0.8 inches) width (at smallest part, top of handle) 2.3 com (0.9 inches) width (at mid-handle) 3.0 cm (1.2 inches) width (at largest part, bottom part of handle)</p>
Open jar task	<p>Jar/lid Brand: Kerr self-sealing mason jar Lid: 7.1 cm (2.8 inches) diameter 22.5 cm (8.8 inches) circumference Jar: 10.0 cm (3.9 inches) tall 5.5 cm (2.2 inches) diameter of bottom of jar 6.5 cm (2.6 inches) diameter of top of jar 20.5 cm (8.1 inches) circumference at mid-point</p>
Tie shoelace task	<p>Shoe: Child’s size 7 16.2 cm (6.4 inches) length 6.9 cm (2.7 inches) width at widest part of toe box Heel is 3.7 cm (1.4 inches) from bottom of wood edge Toe is 6.2 cm (2.4 inches) from top of wood edge Wood base for the shoe (shoe is mounted on): 25.3 cm (10.0 inches) length 13.9 cm (5.5 inches) width Base: 25.4 cm (10.0 inches) length 14.0 cm (5.5 inches) width 28.7 cm (11.3 inches) diagonal ~ 43 degree angle between base and wood with shoe</p>

Use the telephone task	<p>Phone Receiver and Cord: Receiver brand is ITT 21.0 cm (8.3 inches) length 3.0 cm (1.2 inches) width in middle of receiver 5.8 cm (2.3 inches) width at ear and mouth pieces of receiver 52.2 cm (20.5 inches) length of tightly coiled phone line</p> <p>Phone Base: Manufactured by Cortelco Corinth Ms. 22.2 cm (8.8 inches) length 11.9 cm (4.8 inches) width 4.5 cm (1.8 inches) tall to the bottom of number pad (shortest part of base)</p>
Don button down sweater (jacket-style) task	<p>Sweater: Brand- Woolrich Size- Men's 2XL, dark blue, long-sleeved, 5 buttons, two large pockets in front</p>
Put on t-shirt task	<p>T-shirt: Brand- Faded Glory Size- 2XL/50-52, white, short-sleeved, v-neck</p>
General AMAT materials	<p>Table: on four wheels (wheel-locking mechanism available & in place during testing) 122 cm (48 inches) length 76.2 cm (30 inches) width 141.2 cm (55.5 inches) diagonal 72.0 cm (28.3 inches) tall</p> <p>Chair: sturdy chair, without arm-rests, and no wheels 80 cm (31.5 inches) tall to top of seat back 45.9 cm (18.1) inches width of seat back 46.0 cm (18.5) inches diagonal of seat back 40.3 cm (15.9 inches) tall to top of seat 43.7 cm (17.3 inches) width of seat 58.5 cm (23.0 inches) diagonal of seat</p>

Arm Motor Ability Test

Name: _____

Patient Caregiver (circle one)

Therapist/Rater: _____ Assessment Date: ____ / ____ / ____

I. Cut Meat / Knife and Fork Task

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(1) Pick up knife and fork (<i>bilateral task</i>)			____.____
(2) Cut "meat" (Play-doh) (<i>bilateral task, 120sec limit</i>)			____.____
(3) Bring fork to mouth			____.____

II. Foam "sandwich"

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(4) Pick up foam sandwich			____.____
(5) Bring sandwich to mouth			____.____

III. Eat with spoon (video)

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(6) Pick up spoon			____.____
(7) Pick up dried kidney bean with spoon			____.____
(8) Bring spoon to mouth			____.____

AMAT

Subject's Enrollment/Study ID#:

Subject's Initials _____

IV. Drink from mug

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(9) Grasp mug handle			_____. ____
(10) Bring mug to mouth			_____. ____

V. Comb hair

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(11) Pick up comb			_____. ____
(12) Comb hair (120 second limit)			_____. ____

VI. Open jar

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(13) Grasp jar top (bilateral task)			_____. ____
(14) Screw jar top open (bilateral task)			_____. ____

VII. Tie shoelace

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(15) Use both hands to tie the laces on the board in a bow (120 second limit, bilateral task)			_____. ____

VIII. Use telephone

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(16) Bring phone receiver to ear			_____. ____
(17) Dial phone number			_____. ____

IX. Wipe up spilled water (7mL)

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(18) Wipe up water (6 movements)			_____. ____
(19) Discard towel in wastebasket			_____. ____

AMAT

Subject's Enrollment/Study ID#:

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X. Put on button down shirt

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(20) Put affected arm in sleeve, shirt over affected shoulder (<i>bilateral task, 120 sec. limit</i>)			_____. ____
(21) Button two lower buttons (<i>bilateral task</i>)			_____. ____

XI. Put on T-shirt

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(22) Arms in T-shirt sleeves (<i>bilateral task, 120 sec. limit</i>)			_____. ____
(23) Head through neck-hole (<i>bilateral task, 120 sec. limit</i>)			_____. ____
(24) Pull down and straighten shirt (<i>bilateral task</i>)			_____. ____

XII. Prop on extended arm

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(25) Time entire task until block leaves mat			_____. ____

XIII. Light switch/door

Task	Functional Ability (0-5)	Quality of Movement Scale (0-5)	Time (in hundredths of seconds)
(26) Pincer grasp of light switch and flip down			_____. ____
(27) Grasp door handle, rotate handle, open door 6 inches			_____. ____
(28) Close door			_____. ____

Comments: _____

References for Outcome Measures

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