

Fugl-Meyer Motor Assessment UE (UEFMA)

Record ID

Examiner

A. UPPER EXTREMITY

The starting position for all the items is, unless otherwise stated, with the patient seated on a dining type chair without arms. The patient's forearms and hands should rest on the thighs in pronation. If sitting balance is a concern a Velcro trunk strap may be used for safety.

I. Reflex activity

Instructions: "Relax your arm as I support it and test your reflexes."

Flexors: biceps and finger flexors (at least one)

- 0 - None
 2 - Can be elicited

Extensor: triceps

- 0 - None
 2 - Can be elicited

Subtotal I (max 4)

II. Volitional movement within synergies, without gravitational help

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)

Instruction: "Raise your hand toward your ear, bring your elbow up to shoulder height, and keep your thumb pointed up toward the ceiling, like you are answering the telephone, like this (demonstrate)."

Development and Preliminary Validity Study of the Upper Extremity Fugl-Meyer Assessment for Telerehabilitation

| | |
|----------------------------|--|
| Shoulder retraction | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full 3 |
| Shoulder elevation | <input type="radio"/> 0 - None <input type="radio"/> 4 - Partial <input type="radio"/> 5 - Full |
| Shoulder abduction (90*) | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |
| Shoulder external rotation | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |
| Elbow flexion | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |
| Forearm supination | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |

Extensor synergy: hand from ipsilateral ear to the contralateral knee

Instruction: "Raise your hand toward your ear, bring your elbow up to shoulder height, and keep your thumb pointed up toward the ceiling. Then fully straighten your elbow while reaching across your body toward your opposite knee, turning your palm down, like this (demonstrate)."

| | |
|--------------------------------------|--|
| Shoulder adduction/internal rotation | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full 3 |
| Elbow extension | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |
| Forearm pronation | <input type="radio"/> 0 - None <input type="radio"/> 1 - Partial <input type="radio"/> 2 - Full |

Subtotal II (max 18)

**III. Volitional movement mixing synergies,
without compensation**

Hand to lumbar spine, start with hand on lap

- 0 - Cannot perform or hand in front of ant-sup iliac spine
- 1 - Hand behind ant-sup iliac spine (without compensation)
- 2 - Hand to lumbar spine (without compensation)

(Instruction: "Place the back of your hand to your low back, like this (demonstrate)")

Shoulder flexion 0-90*, elbow at 0*,
pronation-supination at 0*

- 0 - Immediate abduction or elbow flexion
- 1 - Abduction or elbow flexion during movement
- 2 - Flexion 90*, no shoulder abduction or elbow flexion

(Instruction: "Fully straighten your elbow at your side and point your thumb forward. Keep your elbow straight and raise your arm up to shoulder height. Do not bend your elbow as you are moving, like this (demonstrate).")

Pronation-supination, elbow at 90*, shoulder at 0*

- 0 - No pronation/supination, starting position impossible
- 1 - Limited pronation/supination, maintains starting position
- 2 - Full pronation/supination, maintains starting position

Instruction: "Place your arm at your side in the (shape of an "L", like this (demonstrate)), and without moving the rest of your arm, turn your palm up and down as far as you can go, like this (demonstrate)."

Subtotal III (max 6)

IV. Volitional movement with little or no synergy

Shoulder abduction 0-90*, elbow at 0*, forearm pronated

- 0 - Immediate supination or elbow flexion
 - 1 - Supination or elbow flexion during movement
 - 2 - Abduction 90*, maintains extension and pronation
- (Instruction: "Rest your arm at your side, fully straighten your elbow, bring your arm out toward the side to shoulder height, keeping your palm facing the floor, like this (demonstrate).")

Shoulder flexion 90-180*, elbow at 0*, pronation-supination at 0*

- 0 - Immediate abduction or elbow flexion
 - 1 - Abduction or elbow flexion during movement
 - 2 - Flexion 180*, no shoulder abduction or elbow flexion
- (Instruction: "Hold your arm straight out in front of your body, straighten your elbow, point your thumb up toward the ceiling. Bring your arm up as far as you can, like this (demonstrate).")

Pronation/supination, elbow at 0*, shoulder at 30-90* flexion

- 0 - No pronation/supination, starting position impossible
 - 1 - Limited pronation/supination, maintains start position
 - 2 - Full pronation/supination, maintains starting position
- (Instruction: "Straighten your arm in front of your body, keep your elbow straight and turn your palm up and down as far as you can go, like this (demonstrate)").)

Subtotal IV (max 6)

V. Normal reflex activity, assessed only if full score of 6 points is achieved in part IV, compared with the unaffected side

Biceps, triceps, finger flexors

- 0 - 2 of 3 reflexes markedly hyperactive or 0 points in part IV
- 1 - 1 reflex markedly hyperactive or at least 2 reflexes lively
- 2 - Maximum of 1 reflex lively, none hyperactive

Subtotal V (max 2)

TOTAL A (Subtotals I-V, max 36)

VI. WRIST

support may be provided at the elbow to take or hold the starting position, no support at wrist, check the passive range of motion prior testing

Wrist stability (elbow 90°)

Apply resistance at 15° dorsiflexion. The elbow may be supported if needed. Lift your hand and hold it there, keep your elbow bent.

- 0 - Less than 15* active dorsiflexion
- 1 - Dorsiflexion 15*, no resistance tolerated
- 2 - Maintains dorsiflexion against resistance

Instruction: "Place your arm at your side in the shape of an "L", palm facing down; without moving the rest of your arm, extend and hold your wrist upwards, like this (demonstrate)."

Wrist flexion/extension (elbow 90°)

The elbow may be supported if needed. Lift your hand up and down, keep your elbow bent.

- 0 - Cannot perform volitionally
- 1 - limited active range of motion
- 2 - full active range of motion, smoothly

(Instruction: "Place your arm at your side in the shape of an "L", palm facing down; without moving the rest of your arm, extend your wrist all the way up and down, like this (demonstrate)."

Wrist stability (elbow 0°)

Apply resistance at 15° dorsiflexion. The elbow may be supported if needed.

- 0 - Less than 15* active dorsiflexion
- 1 - Dorsiflexion 15*, no resistance tolerated
- 2 - Maintain dorsiflexion against resistance

(Instruction: Lift your hand, hold the position with your arm straight.)

Wrist flexion/extension (elbow 0°)

The elbow may be supported if needed. Lift your hand up and down with your arm straight.

- 0 - Cannot perform volitionally
- 1 - Limited active range of motion
- 2 - full range of motion, smoothly

(Instruction: "Straighten your arm in front of your body; keep your elbow straight, extend and hold your wrist upwards, like this (demonstrate)")

Circumduction, elbow at 90*, forearm pronated, shoulder at 0*

- 0 - Cannot perform volitionally
- 1 - Jerky movement or incomplete
- 1 - Complete and smooth circumduction

(Instruction: "Rest your arm in your lap, move your wrist in a circle, like this (demonstrate)")

Subtotal VI (max 10)

TOTAL B (max 10)

VII. HAND

Grasps: Support may be provided proximal to the elbow, keep 90* elbow flexion, no support at the wrist, compare with affected hand, the objects are interposed, active grasp

Mass flexion, from full active or passive extension

- 0 - None
- 1 - Partial
- 2 - Full

(Instruction: Forearm on lap in resting posture. "Make a strong fist, like this (demonstrate)")

Mass extension, from full active or passive flexion

- 0 - None
- 1 - Partial
- 2 - Full

(Instruction: Forearm on lap in resting posture "Open your hand as much as you can, like this (demonstrate).")

Grasp

a. Hook grasp, flexion in PIP and DIP (digits II-V), extension in MCP II-V

- 0 - Cannot be performed
- 1 - Can hold position but weak
- 2 - Maintain position against resistance

(Instruction: "Place your arm at your side in the shape of an "L", like this (demonstrate),"Make your hand look like a hook or claw; don't let me pull your fingers straight, like this (demonstrate).")

**Development and Preliminary Validity Study of the Upper Extremity Fugl-Meyer Assessment for
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b. Thumb adduction
1st CMC, MCP, IP at 0*, scrap of paper between thumb
and 2nd MCP joint

- 0 - Cannot be performed
- 1 - Can hold paper but not against tug
- 2 - Can hold paper against a tug

(Instruction: Place your arm at your side in the shape of an "L".
"Hold this paper between your thumb and index finger keeping them
both straight; don't let me pull it away, like this (demonstrate).")

c. Pincer grasp, opposition
pulpa of the thumb against the pulpa of 2nd finger,
pencil, tug away

- 0 - Cannot be performed
- 1 - Can hold pencil but not against tug
- 2 - Can hold pencil against a tug

(Instruction: Place your arm at your side in the shape of an "L". "Take
the pencil from me with the pads of your thumb and index finger;
don't let me pull it away, like this (demonstrate).")

d. Cylinder grasp
cylinder shaped object (small can) tug away,
opposition of thumb and fingers

- 0 - cannot be performed
- 1 - can hold cylinder but not against tug
- 2 - can hold cylinder against a tug

(Instruction: Place your arm at your side in the shape of an "L". Take
the can from me with your thumb and index fingers wrapped around
it; don't let me pull it away, like this (demonstrate).")

e. Spherical grasp
fingers in abduction/flexion, thumb opposed, tennis
ball, tug away

- 0 - cannot be performed
- 1 - can hold ball but not against tug
- 2 - can hold ball against a tug

(Instruction: Place your arm at your side in the shape of an "L".
Take this tennis ball from my hand with your fingers; don't let
me pull it out of your hand, like this (demonstrate).")

TOTAL VII (max 14)

TOTAL C (max 14)

VIII. COORDINATION/SPEED

sitting, after one trial with both arms, eyes closed, tip of the index finger from knee to nose, 5 times as fast as possible

Instruction "While keeping your eyes closed (or blindfolded), bring your finger (or 1st knuckle) from your knee to your nose as rapidly as possible 5 times, like this (demonstrate). Do not start until I say 'Go' because I am going to time you."

Tremor

- 0 - marked
- 1 - slight
- 3 - none

Dysmetria

- 0 - pronounced or unsystematic
- 1 - slight and systematic
- 2 - no dysmetria

Time
start and end with the hand on the knee

- 0 - at least 6 seconds slower than unaffected side
- 1 - 2-5 seconds slower than unaffected side
- 2 - less than 2 seconds' difference

Subtotal VIII (max 6)

I - V Subtotal

VI. WRIST Subtotal (max 10)

VII. HAND Subtotal (max 14)

VIII. COORDINATION/SPEED Subtotal (max 6)

TOTAL MOTOR FUNCTION UEFMA (max 66)

Telerehabilitation Fugl-Meyer Motor Assessment UE (tUEFMA) for Remote Use

Record ID

Examiner

II. Volitional movement within synergies, without gravitational help

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)

Instruction: "Raise your hand toward your ear, bring your elbow up to shoulder height, and keep your thumb pointed up toward the ceiling, like you are answering the telephone, like this (demonstrate)."

Shoulder retraction

- 0 - None
- 1 - Partial
- 2 - Full

Shoulder elevation

- 0 - None
- 1 - Partial
- 2 - Full

Shoulder abduction (90*)

- 0 - None
- 1 - Partial
- 2 - Full

Shoulder external rotation

- 0 - None
- 1 - Partial
- 2 - Full

Elbow flexion

- 0 - None
- 1 - Partial
- 2 - Full

Forearm supination

- 0 - None
- 1 - Partial
- 2 - Full

Extensor synergy: hand from ipsilateral ear to the contralateral knee

Instruction: "Raise your hand toward your ear, bring your elbow up to shoulder height, and keep your thumb pointed up toward the ceiling. Then fully straighten your elbow while reaching across your body toward your opposite knee, turning your palm down, like this (demonstrate)."

Shoulder adduction/internal rotation

- 0 - None
- 4 - Partial
- 5 - Full

Elbow extension

- 0 - None
- 3 - Partial
- 4 - Full

Forearm pronation

- 0 - None
- 3 - Partial
- 4 - Full

Subtotal II (max 18)

III. Volitional movement mixing synergies, without compensation

Hand to lumbar spine, start with hand on lap

- 0 - Cannot perform or hand in front of ant-sup iliac spine
- 1 - Hand behind ant-sup iliac spine (without compensation)
- 2 - Hand to lumbar spine (without compensation)

(Instruction: "Place the back of your hand to your low back, like this (demonstrate)")

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Shoulder flexion 0-90*, elbow at 0*,
pronation-supination at 0*

- 0 - Immediate abduction or elbow flexion
- 1 - Abduction or elbow flexion during movement
- 2 - Flexion 90*, no shoulder abduction or elbow flexion

(Instruction: "Fully straighten your elbow at your side and point your thumb forward. Keep your elbow straight and raise your arm up to shoulder height. Do not bend your elbow as you are moving, like this (demonstrate).")

Pronation-supination, elbow at 90*, shoulder at 0*

- 0 - No pronation/supination, starting position impossible
- 1 - Limited pronation/supination, maintains starting position
- 2 - Full pronation/supination, maintains starting position

Instruction: "Place your arm at your side in the (shape of an "L", like this (demonstrate), and without moving the rest of your arm, turn your palm up and down as far as you can go, like this (demonstrate).") If this is not possible, you can support your arm close to your elbow against your torso using your less affected arm.

Subtotal III (max 6)

IV. Volitional movement with little or no synergy

Shoulder abduction 0-90*, elbow at 0*, forearm
pronated

- 0 - Immediate supination or elbow flexion
- 1 - Supination or elbow flexion during movement
- 2 - Abduction 90*, maintains extension and pronation

(Instruction: "Rest your arm at your side, fully straighten your elbow, bring your arm out toward the side to shoulder height, keeping your palm facing the floor, like this (demonstrate).")

Shoulder flexion 90-180*, elbow at 0*,
pronation-supination at 0*

- 0 - Immediate abduction or elbow flexion
- 1 - Abduction or elbow flexion during movement
- 2 - Flexion 180*, no shoulder abduction or elbow flexion

(Instruction: "Hold your arm straight out in front of your body, straighten your elbow, point your thumb up toward the ceiling. Bring your arm up as far as you can, like this (demonstrate).")

Pronation/supination, elbow at 0*, shoulder at 30-90* flexion

- 0 - No pronation/supination, starting position impossible
- 1 - Limited pronation/supination, maintains start position
- 2 - Full pronation/supination, maintains starting position

(Instruction: "Straighten your arm in front of your body, keep your elbow straight and turn your palm up and down as far as you can go, like this (demonstrate)". If this is not possible, you can support your arm close to your elbow using your less affected arm, like this (demonstrate))

Subtotal IV (max 6)

VII. HAND

Mass flexion, from full active or passive extension

- 0 - None
- 3 - Partial
- 4 - Full

(Instruction: Forearm on lap in resting posture. "Make a strong fist, like this (demonstrate)")

Mass extension, from full active or passive flexion

- 0 - None
- 4 - Partial
- 5 - Full

(Instruction: Forearm on lap in resting posture "Open your hand as much as you can, like this (demonstrate).")

GRASP: keep 90* elbow flexion, compare with affected hand, the objects are interposed using the less-affected arm/hand, active grasp

a. Hook grasp, flexion in PIP and DIP (digits II-V), extension in MCP II-V

- 0 - Cannot be performed
- 1 - Can hold position but weak
- 2 - Maintain position against resistance

(Instruction: "Place your arm at your side in the shape of an "L", like this (demonstrate),"Make your hand look like a hook or claw; with your stronger hand try to pull your fingers. Hold the position. Don't let your strong hand pull your fingers straight, like this (demonstrate).")

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Telerehabilitation**

-
- b. Thumb adduction
1st CMC, MCP, IP at 0*, scrap of paper between thumb
and 2nd MCP joint
- 0 - Cannot be performed
 1 - Can hold paper but not against tug
 2 - Can hold paper against a tug

(Instruction: Place your arm at your side in the shape of an "L".
"Hold this paper between your thumb and index finger keeping them
both straight; don't let your stronger hand pull it away, like this
(demonstrate).")

- c. Pincer grasp, opposition
pulpa of the thumb against the pulpa of 2nd finger,
pencil, tug away
- 0 - Cannot be performed
 1 - Can hold pencil but not against tug
 2 - Can hold pencil against a tug

(Instruction: Place your arm at your side in the shape of an "L", like this (demonstrate)
and keep it against your trunk. Hold this position. "Take the pencil from your stronger
hand with the pads of your thumb and index finger; don't let your other stronger hand
pull it away, like this (demonstrate).")

- d. Cylinder grasp
cylinder shaped object (small can) tug away,
opposition of thumb and fingers
- 0 - cannot be performed
 1 - can hold cylinder but not against tug
 2 - can hold cylinder against a tug

(Instruction: Place your arm at your side in the shape of an "L", like this
(demonstrate) and keep it against your trunk. Hold this position. Take
the can from your stronger hand, with your thumb and index fingers
wrapped around it; don't let your stronger hand pull it away, like this
(demonstrate).")

- e. Spherical grasp
fingers in abduction/flexion, thumb opposed, tennis
ball, tug away
- 0 - cannot be performed
 1 - can hold ball but not against tug
 2 - can hold ball against a tug

(Instruction: Place your arm at your side in the shape of an "L", like
this (demonstrate) and keep it against your trunk. Hold this
position. Take this tennis ball from your stronger hand with your
fingers; don't let the stronger hand pull it out of your hand, like
this (demonstrate).")

Subtotal VII (max 14)

Subtotal C (max 14)

TOTAL tUEFMA (max 44)
