

## FUGL-MEYER ASSESSMENT LOWER EXTREMITY (FMA-LE)

### Assessment of sensorimotor function

Fugl-Meyer AR, Jaasko L, Leyman I, Olsson S, Steglind S: The post-stroke hemiplegic patient. I. a method for evaluation of physical performance. *Scand J Rehabil Med* 1975, 7:13-31.

E. LOWER EXTREMITY					
<b>I. Reflex activity</b> , supine position		<b>none</b>	<b>can be elicited</b>		
<b>Flexors:</b> knee flexors		0	2		
<b>Extensors:</b> patellar, achilles (at least one)		0	2		
Subtotal I (max 4)					
<b>Verbal instructions:</b> "Relax your leg, I will support it and test your reflexes" <b>Knee flexors:</b> Leg is slightly flexed, abducted, externally rotated. Confirm that the leg is relaxed. Tap on the distal end of the knee flexors muscle. <b>Patella:</b> Hip and knee is slightly flexed, tap on the patella tendon. <b>Achilles:</b> Foot in neutral position, tap on the Achilles tendon.		Elicited reflex activity is determined by visual movement or palpation			
<b>II. Volitional movement within synergies</b> , supine position		<b>none</b>	<b>partial</b>	<b>full</b>	
<b>Flexor synergy:</b> Maximal hip flexion (abduction/external rotation), maximal flexion in knee and ankle joint (palpate distal tendons to ensure active knee flexion).	Hip flexion	0	1	2	
	Knee flexion	0	1	2	
	Ankle dorsiflexion	0	1	2	
<b>Extensor synergy:</b> From flexor synergy to the hip extension/adduction, knee extension and ankle plantar flexion. Resistance is applied to ensure active movement, evaluate both movement and strength (compare with the unaffected side)	Hip extension	0	1	2	
	Knee adduction	0	1	2	
	Ankle extension	0	1	2	
Subtotal II (max 14)					
<b>Flexor synergy</b> <b>Verbal instructions:</b> "Bring your knee fully toward your chest, and bend your ankle up toward you at the same time". <b>Initial position:</b> Supine, leg extended touching the contralateral leg/foot. <b>End position:</b> Hip and knee fully flexed, ankle fully dorsiflexed. Palpate the distal knee flexor tendons to ensure active knee flexion. Slight hip abduction and external rotation is allowed but not scored		The task can be repeated several times to allow assessor to evaluate each part of the movement.  To score 2, compare with the unaffected side.  Assessor can assist the subject to attain the starting position.  <b>In extensor synergy,</b> make sure that the movement is active (apply slight resistance in order to eliminate the gravitational facilitation).			
<b>Extensor synergy</b> <b>Verbal instructions:</b> "From full flexion of the hip, knee and dorsiflexion of the ankle (as in the end of the flexor synergy); extend your leg down toward the other leg and point your foot and toes downward". <b>Initial position:</b> As the end position of the flexor synergy. <b>End position:</b> Hip and knee fully extended, complete plantarflexion at the ankle.					

<b>III. Volitional movement mixing synergies</b>		none	partial	full
sitting position, knee 10cm from the edge of the chair/bed				
<b>Knee flexion</b> from actively or passively extended knee	no active motion less than 90° active flexion, palpate tendons of hamstrings more than 90° active flexion	0	1	2
<b>Ankle dorsiflexion</b> compare with unaffected side	no active motion limited dorsiflexion complete dorsiflexion	0	1	2
Subtotal III (max 4)				
<p><b>Knee flexion</b>  <b>Verbal instructions:</b> "Straighten your knee; and from this position bend (flex) your knee as far as possible under your chair/bed".  <b>Initial position:</b> Seated, knee partly extended and free to move under the chair.  <b>End position:</b> Seated, knee flexion beyond 90°.</p> <p><b>Ankle dorsiflexion</b>  <b>Verbal instructions:</b> "Bend (flex) your ankle upward as far as possible".  <b>Initial position:</b> Seated with feet flat on the floor.  <b>End position:</b> Seated, full dorsiflexion of the ankle.</p>		<p>Ensure that the knee flexion is active (palpate the tendons of the knee flexors).</p> <p>Do not allow compensation with trunk.</p> <p>To score 2, compare with the unaffected side</p>		
<b>IV. Volitional movement with little or no synergy</b>		none	partial	full
standing position, hip at 0°				
<b>Knee flexion to 90°</b> hip at 0°, balance support is allowed	no active motion or immediate, simultaneous hip flexion less than 90° knee flexion and/or hip flexion during movement at least 90° knee flexion without simultaneous hip flexion	0	1	2
<b>Ankle dorsiflexion</b> compare with unaffected side	no active motion limited dorsiflexion complete dorsiflexion	0	1	2
Subtotal IV (max 4)				
<p><b>Knee flexion to 90°</b>  <b>Verbal instructions:</b> "Raise your foot behind you so that your lower leg is parallel to the floor (at least 90° flexion in the knee), try to keep you hip straight; you can have support to keep the balance".  <b>Initial position:</b> Standing, with hip and knees extended.  <b>End position:</b> Standing, affected knee flexed at least 90°, hip extended.</p> <p><b>Ankle dorsiflexion</b>  <b>Verbal instructions:</b> "Bend (flex) your ankle upward as far as possible".  <b>Initial position:</b> Standing with feet flat on the floor.  <b>End position:</b> Standing, full dorsiflexion of the ankle.</p>		<p>Do not allow compensation with trunk and/or hip.</p> <p>To score 2, compare with the unaffected side</p>		
<b>V. Normal reflex activity</b>		hyper	lively	normal
supine position, assessed only if full score of 4 points is achieved in part IV, compare with the unaffected side				
<b>Reflex activity</b> knee flexors, Patellar, Achilles,	2 of 3 reflexes markedly hyperactive 1 reflex markedly hyperactive or at least 2 reflexes lively maximum of 1 reflex lively, none hyperactive	0	1	2
Subtotal V (max 2)				
<p><b>Instructions:</b> Same as in Part I, Reflex activity.</p> <p>The reflex lively indicates a reflex activity which is slightly stronger than the reflex activity in the unaffected side; the markedly hyperactive reflex activity indicates markedly stronger reflexes (e.g. reflexes can be elicited by slight tap or touch alone).</p>		<p>Elicited reflex activity is determined by visual movement or palpation</p>		
<b>Total E</b> (max 28)				

<b>F. COORDINATION/SPEED</b> , supine, after one trial with both legs, eyes closed, heel to knee cap of the opposite leg, 5 times as fast as possible		<b>marked</b>	<b>slight</b>	<b>none</b>
<b>Tremor</b>		0	1	2
<b>Dysmetria</b>	pronounced or unsystematic slight and systematic no dysmetria	0	1	2
		<b>≥ 6s</b>	<b>2 - 5s</b>	<b>&lt; 2s</b>
<b>Time</b> start and end with the leg on the bed/table	at least 6 seconds slower than unaffected side 2-5 seconds slower than unaffected side less than 2 seconds difference	0	1	2
<b>Total F</b> (max 6)				
<p><b>Verbal instructions:</b> Bring your heel to the knee cap of the opposite leg, as fast as possible, five times. I am going to take time.</p> <p><b>Initial position and end position:</b> Supine position, legs straight and slightly apart resting on the bed/treatment table.</p> <p><b>Tremor and dysmetria:</b> Can only be assessed and scored when 5 complete movements from bed to knee (or close to knee can be performed by the subject.</p> <p><b>Time:</b> Start stopwatch when the leg leaves the bed/treatment table and stop the stopwatch when the leg is back on the bed/treatment table after 5 repetitions.</p>		<p>Ensure that the subject understands the instructions (perform the task few times without timing if needed).</p> <p>Do not allow compensation with other leg.</p> <p>Score 0 all parts when the task cannot be completed 5 times.</p>		
<b>TOTAL E-F</b> (max 34)				

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<b>H. SENSATION</b> , lower extremity eyes closed, compare with the unaffected side		<b>anesthesia</b>	<b>hypoesthesia or dysesthesia</b>	<b>normal</b>
<b>Light touch</b>	leg	0	1	2
	foot (sole)	0	1	2
		<b>less than 3/4 correct or absence</b>	<b>3/4 correct or considerable difference</b>	<b>correct 100%, little or no difference</b>
<b>Position</b> small alterations in the position	hip	0	1	2
	knee	0	1	2
	ankle	0	1	2
	great toe (IP-joint)	0	1	2
<b>Total H</b> (max12)				

<b>I. PASSIVE JOINT MOTION</b> , lower extremity supine position, compare with the unaffected side					<b>J. JOINT PAIN</b> during passive motion, lower extremity		
		only few degrees	decreased	normal	pronounced pain during movement or very marked pain at the end of the movement	some pain	no pain
<b>Hip</b>	Flexion	0	1	2	0	1	2
	Abduction	0	1	2	0	1	2
	External rotation	0	1	2	0	1	2
	Internal rotation	0	1	2	0	1	2
<b>Knee</b>	Flexion	0	1	2	0	1	2
	Extension	0	1	2	0	1	2
<b>Ankle</b>	Dorsiflexion	0	1	2	0	1	2
	Plantar flexion	0	1	2	0	1	2
<b>Foot</b>	Pronation	0	1	2	0	1	2
	Supination	0	1	2	0	1	2
<b>Total</b> (max 20)					<b>Total</b> (max 20)		

<b>E. LOWER EXTERMTY</b>	/28
<b>F. COORDINATION / SPEED</b>	/6
<b>TOTAL E-F (motor function)</b>	/34

<b>H. SENSATION</b>	/12
<b>I. PASSIVE JOINT MOTION</b>	/20
<b>J. JOINT PAIN</b>	/20