Modified Emory Functional Ambulation Profile (mEFAP): Reference Guide

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Introduction

The *Modified Emory Functional Ambulation Profile (mEFAP)* is a simple observational gait speed test designed for ease of administration. It is used as an outcome measure for tracking change in the rehabilitation of patients with post-stroke motor dysfunction. It requires the patient to navigate five common environmental simulations in order to evaluate the person's mobility and quantify the effect of assistive devices on the user. [1]

Establishing Authors: Baer HR, Wolf SL (2001)

Data Type: Ratio

Measurement Type: Performance-based

Assessment Type: Observer

Psychometric Properties

The mEFAP has been shown to have a high level of interrater reliability and both construct and concurrent validity in post stroke patients.[1] The mEFAP is a useful tool for measuring ambulatory function and recovery in this population.[2] Studies with the mEFAP did not reveal ceiling effect.

Reliability: The mEFAP has high interrater reliability and test-retest reliability.[1,2]

Validity: The mEFAP has both a high construct validity and concurrent validity for stroke patients.[1,2]

Sensitivity: Studies indicate the mEFAP is sensitive to change for walking function during rehabilitation in post stroke patients.[1,2]

Responsiveness: Standardized response mean was 1.1 ($P<0.0001$) indicating good responsiveness to change in the stroke rehabilitation population.[2]

Feasibility

The mEFAP is considered an inexpensive and easy to administer quantitative assessment of stroke patient ambulation. The mEFAP measures time over a standardized set of surfaces and common community and household obstacles.[3]

Required Resources

Time: ~20 minutes

Personnel: Participant, Test Administrator, and Assistant, if possible

Equipment: stop watch, chair with armrests (46 cm seat height), measuring tape, brick, hard surface with rubber trash can (40 gallon), four steps with railing

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Space: flooring (7 m), carpeted surface or rug (7 m x 2 m)

Cost: Free

Test Administration

The mEFAP should be performed pre and post treatment The patient is timed while walking through 5 common activities encountered during activities of daily living, The tasks are ordered from least involved to most involved in order to reduce patient fatigue.

Task 1: Timed 5-meter walk on a hard surface

Task 2: Timed 5-meter walk on a carpeted surface

Task 3: TUG test

Task 4: Traversing a standard obstacle course

Task 5: Ascending and descending 5 stairs

Times for each individual task are recorded and multiplied by the assistance factor (AF). The AF's are ranked in order of the perceived severity of the gait-related dysfunction that mandates their use.[3]

The assistance factor increases relative to the level of assistive device used by a patient. It does this in several ways:

- Records the level of support needed
- Reflects a difference when the support level changes, but the time does not
- Reflects differences in speed when the patient progresses from one device to another.
- Relays information to other healthcare providers about the level of assistance required by the patient

After establishing scores for each task, all task scores are added together. The Modified EFAP allows for manual assistance, which is recorded separately, but does not factor into the score.

Once all tasks are recorded, time is multiplied by the level of assistance needed.

The following scoresheet is an example of a mEFAP score sheet:

Option 2 mEFAP Scoring Sheet Example (Adapted from Baer and Wolf, 2001)							
	Time (s)	**5mWT-Floor**	**5mWT-Carpet**	**TUG**	**Obstacles**	**Stairs**	**mEFAP Total**
	Initial						
	Device Delivery						
	Follow-up						
	Assistive Device/Orthotic (assistance factor)						
Increasing level of assistance used/needed ↓	AFO (x1)						
	KAFO (x2)						
	Straight Cane (x3)						
	Narrow Based Quad Cane (x4)						
	Large Based Quad Cane (x5)						
	Hemiwalker (x6)						
	Walker (x7)						
	Manual Assistance (assistance factor)						
	Completely Independent (x1)						
	Modified Independent (x2)						
	Supervision (x3)						
	Contact Guard (x4)						
	Minimal Assistance (x5)						
	Moderate Assistance (x6)						
Modifiend Independent - requires extra time or devices; Supervision - requires cueing or prompting; Contact Guard - requires close contact support;							
Minimal Assistance - performs at least 75% of task; Moderate Assistance - performs 50-74% of task.							

Interpretation

Changes in mEFAP time scores are interpreted as a change in functional status, however no "normal" range has been established. This is due to a skewing of the data toward patients with greater improvement in scores.[1]

It is important to use the test prior to delivery and at follow-up to show change. When comparing the scores from before and after, a greater change in score indicates a better treatment result. Times can vary widely from patient to patient due to the difference in severity of presentation in stroke patients.[1]

Most patients reduce the amount of AD and MA needed from the initial to the follow up test administration. The times were not significantly altered by the level of AD or MA suggesting that the time and the level of support are independent from one another.[1]

Minimal detectable change is 8.81 seconds[1].

Limitations

Limitations include the lack of established scores associated with successful household or community ambulators. In scoring, the assistance factors are ranked in order of the "perceived severity" of the gait-related dysfunction that mandates their use. No quantified research is available establishing standard

multipliers for every option in lower extremity assistive devices. The scoring when multiplying by the AF is relative to the severity of each individual patient and is useful for showing individual change, but may not provide a definitive comparison between two different patients. In addition, there is no delineation between the level of assistance offered by various orthotic interventions, such as between a solid AFO vs. an articulated AFO.

Documentation in Clinical Notes

Example: Patient was evaluated and fit with an orthosis and was assessed prior to delivery of the device. The times and assistance levels needed for each task were recorded prior to delivery, The orthosis was fit to the patient who was then reassessed with the mEFAP following delivery. Again, time and assistance level were recorded for each task. A difference between the initial score and the second sore would demonstrate improvement as a result of the orthotic intervention. The lower score could be a result of decreased time or of deceased use of assistive device.

Disclaimer: The Authors, the Outcomes Research Committee, and the American Academy of Orthotists and Prosthetists does not endorse the use of any single outcome measure over any other single outcome measure and declares no conflict of interest in the presentation of this measure. There may be multiple versions of the instructions published in research literature. This reference guide has attempted to remain consistent with the instructions from the original developers of the outcome measure wherever possible, however in some instances one version of the instructions was chosen for ease of use in the clinic.

References

1. Heather R Baer, MD; Steven L. Wolf, PhD, PT, FAPTA. Modified Emory Functional Ambulation Profile: An Outcome Measure for the Rehabilitation of Poststroke Gait Dysfunction. Stroke. 2001; 32:973-979.

2. Psychometric properties of the modified Emory Functional Ambulation Profile in stroke patients. Clinical Rehabilitation. 2006; 20: 429-437

3. Wolf SL, Catlin PA, Gage K, Gurucharri K, al e. Establishing the reliability and validity of measurements of walking time using the Emory Functional Ambulation Profile. *Phys Ther*. 1999;79(12):1122-33.

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Outcome Measure

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