

Modified Friedreich Ataxia Rating Scale (mFARS) – Data Collection Worksheet

Subject ID: _____ Test Date: _____

Time test started: Before 12pm 12pm - 4pm After 4pm

How was the assessment completed? In person Virtual (Audio & Video)

NEUROLOGICAL EXAMINATION: rate each item on the basis of the subject status during examination. To the extent possible, sequential subject examinations should be carried out at the same time of the day. For items where 0.5 increments are offered, 0.5 may be use if the examiner feels an item falls between two severities.

A. BULBAR

A3. Cough

Ask patient to cough as hard as you can, three times. Accept the strongest attempt.

A3. Cough score: 0.0 = Normal
0.5
1.0 = Depressed
1.5
2.0 = Totally or nearly absent

A4. Speech

*Ask the patient to read or repeat the sentences. A "The President lives in the White House."
B "The traffic is heavy today."*

A4. Speech score: 0.0 = Normal
0.5
1.0 = Mild (all or most words understandable)
1.5
2.0 = Moderate (most words not understandable)
2.5
3.0 = Severe (no or almost no useful speech)

Sub-Total BULBAR: [Calculated – Score=A3 + A4, Range 0-5]

B. UPPER LIMB COORDINATION

B1. Finger-to-Finger Test

Assist participant into a position of shoulder abduction so that elbows reach the horizontal plane. Elbows are at 75-90 degrees of flexion and hands are 25 cm from the sternum. While supporting their arms, have them touch their index fingers together and then move them 2.5 cm apart. Ask them to hold this position and remove your support. Downward drift of elbows is allowed. Observe for 10 seconds. Score amplitude of finger oscillations. If elbows require contact with body or surface, then they score a 3.0.

B1a. Right score: 0.0 = Normal (0 – 0.5 cm)
0.5
1.0 = Mild oscillations of finger (0.5- 2 cm)
1.5

B1b. Left score: 2.0 = Moderate oscillations of finger (2-6 cm)
2.5
3.0 = Severe oscillations of finger (greater than 6.0 cm) and/or elbows require contact with body or surface, unable to perform task

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B2. Nose-Finger Test

Examiner holds index finger at 90% reach of participant and test 3 nose-finger-nose trials; assess participant's finger path through a straight on view. Assess kinetic or intention tremor during and towards the end of the movement.

B2a. Right score:

- 0 = None
- 1 = Mild (less than 2 cm. amplitude)
- 2 = Moderate (2-6 cm. amplitude or persisting through movement)

B2b. Left score:

- 3 = Severe (greater than 6 cm. and persisting through movement)
- 4 = Too poorly coordinated to perform task

B3. Dysmetria Test

Examiner explains to participant that they need to reach out and touch the tip of examiner's index finger as it moves to four corners of an imaginary square, going back and forth from participant's chin to examiner's finger. The imaginary square is about 25cm each side and should be about 50% distance from the full reach of the patient's arm. This is repeated 8 times as the examiner verbally cues the participant to touch his/her finger as it moves in a clockwise direction, making 2 complete navigations of the square. Test is performed at a fast pace. The examiner assesses the participant's forward reach and tracks the accuracy of the movement. Assess dysmetria, tip of finger is defined as any part of the examiners DIP joint (i.e., inaccuracy of reaching the target – examiner's finger). There is no penalty for tremor.

B3a. Right score:

- 0 = None (no misses)
- 1 = Mild (1 – 2 misses)
- 2 = Moderate (misses 3-5 times)

B3b. Left score:

- 3 = Severe (misses 6-8 times)
- 4 = Too poorly coordinated to perform task

B4. Rapid Alternating Movements of Hands

Stopwatch required. Have participant flex their elbow so their forearm is 15 cm above the thigh and forearm in a pronated position (palm facing up). Demonstrate forearm pronation/supination and explain that the movement is like placing their hand on a doorknob and turning it back and forth. Cue participant that they should not brace their elbow to their side as this is compensation. Allow participant to practice as you count out loud. Instruct participant to complete 10 cycles as quickly as possible. 1 cycle is a full supination and pronation movement. Use a stopwatch to measure time to complete 10 cycles. The examiner keeps count and says "go" and "stop." Assess rate, rhythm, body position, and accuracy. If time to completion is >7.0 seconds then 0.5 is added to the score.

B4a. Right score:

time in seconds:

- 0.0 = Normal
- 0.5
- 1.0 = Mild (slightly irregular or slowed) wrist and elbow remain in relatively fixed position away from torso

B4b. Left score:

time in seconds:

- 1.5
- 2.0 = Moderate (irregular and slowed) or participant compensates by bracing elbow on their trunk or there is noted elbow excursion during maneuver

- 2.5
- 3.0 = Too poorly coordinated to perform task.

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B5. Finger Taps (index finger tip-to-thumb crease)

Stopwatch required. Position participant with shoulder abducted to horizontal plane and elbows flexed at 75 to 90 degrees. Ask the participant to tap on the thumb crease (DIP joint) with the tip of their index finger with a movement amplitude of at least 1.0 cm. Demonstrate 15 reps as fast as possible. Demonstrate an excursion of at least 1 cm. Cue participant that you will tell them when to start and stop and they should perform task as quickly as possible. Use stopwatch to measure time as you count for the participant. The examiner keeps count and says “go” and “stop.” Each miss of the thumb crease is distinguished as a mistake. If time > 6 seconds, add 1 to score.

B5a. Right

0 = Normal.

1 = Mild (misses 1-3 times)

2 = Moderate (misses 4-9 times)

3 = Severe (misses 10-15 times)

4 = Cannot perform the task and/or unable to maintain start position

time in seconds: _____

B5b. Left

time in seconds: _____

[Calculated –

Score=B1a+B1b+B2a+B2b+B3a+B3b+B4a+B4b+B5a+B5b,
Range 0-36]

Sub-Total Upper Limb Coordination:

C. LOWER LIMB COORDINATION

Participant is in a supine position on the plinth with their head elevated for visualization of the lower extremities. The participant should lie with knees extended and kneecaps/toes pointing upward. If the participant has difficulty transferring to an exam table/chair this can be done in their adapted seating system with a small stool place in front for their legs to be extended out in front of them with feet supported.

C1. Heel Along Shin Slide

Demonstrate this maneuver by lifting the participant’s lower leg and guiding it through movement of the heel down the shin. Cue them to watch their heel, touch heel to the opposite leg (just under kneecap), slide heel on the tibia to the ankle, take heel off ankle, place heel down onto plinth or stool, and bring heel back to the contralateral shin- just below patella. Ask them to repeat 3 cycles of this movement at moderate speed- one second per excursion of hip flexion or extension. Assessing contact with shin and smoothness of the movement.

C1a. Right score:

0 = Normal (stay on shin).

1 = Mild (abnormally slow, tremulous but contact maintained)

2 = Moderate (goes off shin a total of 3 or fewer times during 3 cycles)

3 = Severe (goes off shin 4 or more times during 3 cycles)

4 = Too poorly coordinated to perform task.

C1b. Left score:

C2. Heel-to-Shin Tap

The participant identifies a comfortable spot on their mid-shin as target. Under visual control, participant taps heel on the target on the opposite shin 8 times on each side from about 15-25 cm above from the shin, one at a time. Examiner keeps count and says “go” and “stop.” The number of times the heel misses the selected spot is assessed.

C2a. Right score:

0 = Normal (stays on target)

1 = Mild (misses shin 2 or less times)

2 = Moderate (misses shin 3-5 times)

3 = Severe (misses shin greater than 5 times)

4 = Too poorly coordinated to perform task or cannot assume start position due to contractures or other impairments.

C2b. Left score:

Sub-Total Lower Limb Coordination:

[Calculated – Score=C1a+C1b+C2a+C2b, Range 0-16]

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E. UPRIGHT STABILITY

Ea. Is the subject barefoot?

- Barefoot (preferred) Footwear

Eb. Indicate if AFOs [plastic brace] are used:

- Yes No

Ec. Test performed on carpet?

- Yes No

Participant is in an upright seated position on the edge of the plinth or chair with back unsupported. If participant is not able to transfer from personal adapted seating device, see if they can scoot forward a few inches so that back is unsupported. There should be 1-2 inches of space between the edge of seating platform and the back of their lower leg. The participant should sit with 90 degrees of hip flexion and 90 degrees of knee flexion. The participant will fold their arms across their chest so hands rest on their elbows. If a participant cannot sit unsupported in the defined position, they receive a score of a 4. Place examiner in front of participant and have an assistant stand behind or to one side of the participant to assist if participant begins to lose their balance. Observe for 30 seconds.

E1. Sitting Posture score: 0 = Normal

- 1 = Mild oscillations of head/trunk without touching chair back or side
2 = Moderate oscillations of head/trunk; needs contact with chair back or side for stability
3 = Severe oscillations of head/trunk; needs contact with chair back or side for stability
4 = Requires moderate to maximal support of one to two people, or cannot assume start position.

E2a. Stance feet apart, eyes open

Participant is to stand with medial border of their feet 20cm apart with toes pointing forward along a horizontal tape line on the floor. The MTP joints should be on the horizontal line. The participant will have their arms and hands by their sides or in a position of their choosing during testing with visual gaze fixed at a spot of their choosing. Stopwatch required. Instruct the participant that you will be timing their ability to stand in this position. Have an examiner and an assistant on each side of the participant to catch them if they lose their balance. Use a stopwatch up to 3 attempts. As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

If the participant cannot perform the first stance test (feet apart eyes open) without assistance (holding examiner or table or walker) then a score of 4 is given for all 3 trials of this test and none of the other stance tests are attempted with max score of 4 applied for all trials of all tests (2b, 3a, 3b, and 5). Tandem stance should still be attempted.

Participant can seek support in between trials; holding on to the table, chair or examiner.

E2a1. Trial one score: 0 = 1 minute or longer

- 1 = Less than 1 minute, greater than 45 seconds

E2a2. Trial two score:

- 2 = Less than 45 seconds, greater than 30 seconds

- 3 = Less than 30 seconds, greater than 15 seconds

- 4 = Less than 15 sec. or needs hands held by assistant/device or cannot assume start position.

E2a3. Trial three score:

E2a. Average [Calculated – E2a1+E2a2+E2a3/3, Range 0-4]

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E2b. Stance feet apart, eyes closed

Stopwatch required. Inform the participant that they are going to do the same standing task but with their eyes closed. When participant feels ready, say “go” to have them close eyes. Have the examiner and an assistant stand on each side of participant to watch their eyes and assist if participant begins to sway. Stop timing if the participant blinks or opens eyes. Use a stopwatch to measure up to 3 attempts

As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

E2b1. Trial one score: 0 = 1 minute or longer

1 = Less than 1 minute, greater than 45 seconds

E2b2 Trial two score: 2 = Less than 45 seconds, greater than 30 seconds

3 = Less than 30 seconds, greater than 15 seconds

E2b3. Trial three score: 4 = Less than 15 sec. or needs hands held by assistant/device

E2b. Average: [Calculated E2b1+E2b2+E2b3/3, Range 0-4]

E3a. Stance feet together, eyes open

Participant is to stand with medial border of feet touching at both the MTP joints and heels. If the participant is “knock-kneed” or has other orthopedic issue that prevents feet from touching at front and back then having feet touching at one location is sufficient. The participant will have their arms and hands by their sides or in a position of their choosing during testing with visual gaze fixed at a spot of their choosing. Stopwatch required. Instruct the participant that you will be timing their ability to stand in this position. Have the examiner and an assistant stand on each side of participant to assist if participant begins to sway. Use a stopwatch to measure up to 3 attempts.

As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

If the participant cannot assume the relevant position for 3a (feet together eyes open) without assistance (holding examiner or table or walker) then a score of 4 is given for all 3 trials of this test and 3b). Tandem stance should still be attempted.

E3a1. Trial one score: 0 = 1 minute or longer

1 = Less than 1 minute, greater than 45 seconds

E3a2. Trial two score: 2 = Less than 45 seconds, greater than 30 seconds

3 = Less than 30 seconds, greater than 15 seconds

E3a3. Trial three score: 4 = Less than 15 sec. or needs hands held by assistant/device

E3a. Average [Calculated - E3a1+E3a2+E3a3/3, Range 0-4]

E3b. Stance feet together eyes closed

Stopwatch required. Inform the participant that they are going to do the same standing task but with their eyes closed. When participant feels ready, say “go” to have them close eyes. Have examiner and an assistant stand on each side of participant to watch their eyes and assist if participant begins to sway. Stop timing if the participant blinks or opens eyes. Use a stopwatch to measure up to 3 attempts. As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

E3b1. Trial one score: 0 = 1 minute or longer

1 = Less than 1 minute, greater than 45 seconds

E3b2. Trial two score: 2 = Less than 45 seconds, greater than 30 seconds

3 = Less than 30 seconds, greater than 15 seconds

E3b3. Trial three score: 4 = Less than 15 sec. or needs hands held by assistant/device

E3b. Average: [Calculated E3b1+E3b2+E3b3/3, Range 0-4]

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Which foot was in front during tandem stance?

Right

Left

E4. Tandem Stance

Assist participant into a tandem stance position with their dominant foot in back and non-dominant foot in front. The dominant foot is the one they feel they balance the best upon when asked to stand on one leg. The toe of the dominant foot should touch the heel of the non-dominant foot. Stopwatch required. Instruct the participant that you will be timing their ability to stand in this position. Have examiner and an assistant stand on each side of participant to assist if participant begins to lose their balance. Use a stopwatch to measure up to 3 attempts. As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

E41. Trial one score: 0 = 1 minute or longer

1 = Less than 1 minute, greater than 45 seconds

E42. Trial one score: 2 = Less than 45 seconds, greater than 30 seconds

3 = Less than 30 seconds, greater than 15 seconds

E43. Trial one score: 4 = Less than 15 sec. or needs hands held by assistant/device

E4. Average [Calculated E41+E42+E43/3, Range 0-4]

E5. Stance on Dominant Foot

Participant achieves single limb stance by flexing hip of non-dominant leg and keeping knee in an extended position. Heel should be several inches off the floor. Stopwatch required. Instruct the participant that you will be timing their ability to stand on one foot. With examiner in front of participant, have an assistant stand behind or on side of participant to assist if participant begins to sway. Use a stopwatch to measure up to 3 attempts. As soon as the participant is able to exceed 60 seconds (on the first or second trial), no subsequent trials are required and score of zero is recorded for the remaining trial(s).

E51. Trial one score: 0 = 1 minute or longer

1 = Less than 1 minute, greater than 45 seconds

E52. Trial two score: 2 = Less than 45 seconds, greater than 30 seconds

3 = Less than 30 seconds, greater than 15 seconds

E53. Trial three score: 4 = Less than 15 sec. or needs hands held by assistant/device

E5. Average [Calculated E51+E52+E53/3, Range 0-4]

E6 Tandem Walk

Participant will tandem walk at least 8 steps in a straight line. Performed in hallway or long room with no furniture within reach of 1m/3ft and no loose carpet. Demonstrate task for the participant, specifying how the heel and toe touch with each step. The heel of the front foot should touch the toes of the foot in back as they take steps. Arms can be extended for more balance. Always do this test on the same surface/location (bare floor). Instruct participant to begin in a tandem stance and then to begin walk with at least 8 steps. Examiner and assistant can walk close to participant for safety if needed. Count the number of steps completed in a single trial. Score based on number of steps.

E6. Tandem walk score: 0 = Normal (able to tandem walk 8 or greater sequential steps)

1 = Able to tandem walk greater than 4 sequential steps, but less than 8

2 = Can tandem walk, but fewer than 4 steps before losing balance.

3 = Too poorly coordinated to attempt task.

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E7 Gait

Standing with or without an assistive walking device. Performed in hallway or long room with no furniture within reach of 1m/3ft and no loose carpet. Observe participant walking at a typical pace in one direction for 8 meters or 25 feet participant. Scoring based on amount of ataxia and if assistive devices are required.

E7. Gait score:

- 0 = Normal
- 1 = Mild ataxia/veering/difficulty in turning; no cane/other support needed to be safe
- 2 = Walks with definite ataxia; may need intermittent support/examiner needs to walk with participant for safety
- 3 = Moderate ataxia / veering / difficulty turning; walking requires cane/holding onto examiner with one hand for safety
- 4 = Severe ataxia/veering; walker or both hands of examiner needed
- 5 = Cannot walk even with assistance (wheelchair bound)

Sub-Total Upright Stability:

[Calculated – Score =E1+E2a+E2b+E3a+E3b+E4+E5+E6+E7, Range 0 - 36]

Total mFARS score:

[Calculated – Score =Sub-Totals A. Bulbar + B. Upper limb + C. Lower limb+ E. Upright stability, Range 0-93]