

The North Star Ambulatory Assessment

The **North Star Ambulatory Assessment** has been developed by the Physiotherapy Assessment and Evaluation Group of the North Star Clinical Network for the assessment of ambulant boys with Duchenne muscular dystrophy (DMD)

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NORTH STAR AMBULATORY ASSESSMENT (NSAA)

The following pages give test details and instructions for the patient and a scoring sheet with details for grading. They should be used in conjunction with each other. Please familiarise yourself with the test detail before starting to evaluate patients.

Clear explanations of the methods employed to achieve motor goals are given but it is not possible to be exhaustive in the descriptions, particularly of modifications to activity. DMD children usually present with commonly recognisable adaptations to activity but they may modify their activity to achieve functional goals in slightly differing ways. Generally however activities are graded in the following manner:

- 2 - 'Normal' – no obvious modification of activity
- 1 - Modified method but achieves goal independent of physical assistance from another
- 0 - Unable to achieve independently

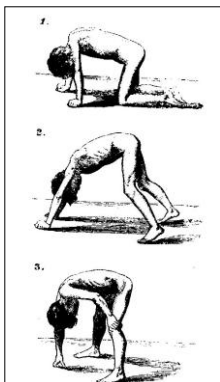
Equipment

15cm high box step, height appropriate chair/height adjustable plinth, stopwatch, 10m marked 'runway'

General test instructions

- If you think that the child is capable of a better performance, it is acceptable to ask the child to repeat the item and re-score if appropriate. You should attempt all activities at each assessment
- Do not use a mat unless it is required to gain co-operation. If a mat must be used, make sure it is not heavily padded. Note in comments and do so for all subsequent evaluations
- Please note that for many of the items socks and shoes should not be worn
- For the timed tests – rise from floor and 10m 'run' - please note the time in seconds and only to the nearest tenth of a second

Rise from floor



Components of Gowers' manoeuvre:

- Turns towards the floor (into a four-point kneeling position or rolls to prone)
- Places hands on the floor to assist rising and walks hands back in towards him
- Uses one or both arms to push up on legs to achieve upright standing
- Large base of support by abducting hips and extending knees

Figure: Gowers' Manoeuvre (from W.R. Gowers' *Pseudohypertrophic muscular paralysis*, 1879)

North Star Ambulatory Assessment Test Detail and Instructions to Patient

Test Item	Instructions to patient	Start position/test detail	Comments
1. Stand	Can you stand up tall for me for as long as you can and as still as you can	Feet should be no further than 10cm apart and heels on the ground if possible. Arms by sides. NO shoes should be worn.	Minimum count of 3 seconds to score 2.
2. Walk	Can you walk from A to B (state to and where from) for me.	Walk without shoes/socks on. Observe walk for at least 10 steps in both sagittal and coronal planes.	If the patient generally toe walks but occasionally gets heels flat, or can on request they should score 1. Should be enough of a distance to observe 'normal gait' for that subject
3. Stand up from chair	Stand up from the chair keeping your arms folded if you can	Starting position 90° hips and knees, feet on floor/supported on a box step.	Use a size-appropriate chair (without armrests) or height adjustable plinth. Alternatively a box step under the feet to achieve the correct starting position could be used. Arms should be kept crossed throughout the activity to score 2.
4 & 5. Stand on one leg Right + Left	Can you stand on your right/left leg for as long as you can?	Minimum count of 3 seconds to score 2. NO shoes should be worn.	Best done on the floor rather than on a mat.
6 & 7. Climb box step Right + Left	Can you step onto the top of the box using your right/left leg first?	Stands facing the box step. Step should be 15cm high	Support may be provided by the use of a height adjustable plinth, or, if not available one 'neutral' hand from the therapist.
8 & 9. Descend box step Right + Left	Can you step down from the box using your right/left leg first?	Stands on top of the box step facing forwards. Step should be 15cm high	Support may be provided by the use of a height adjustable plinth, or, if not available one 'neutral' hand from the therapist.
10. Gets to sitting	Can you get from lying to sitting?	Starting position supine on a mat. No pillow should be used under head.	If patient turns into prone or towards the floor to work their way into sitting 1 should be scored. Aiming for long sitting.
11. Rise from floor	Can you get up from the floor as fast as you can (from supine)?	Starting position supine with arms by sides, legs straight. No pillow to be used.	Score 1 if the child stands independently of furniture but demonstrates <i>any part</i> of the Gowers' manoeuvre. Attempt activity without use of furniture in the first instance.
12. Lifts head	Can you lift your head to look at your toes keeping your arms folded?	Supine, arms folded across chest. No pillow should be used.	Ask patient to keep arms crossed over chest during the activity to avoid self-assist. Also ask to look at toes to ensure neck is flexed – should be a chin to chest manoeuvre.
13. Stands on heels	Can you stand on your heels?	Standing on the floor. No shoes to be worn.	Must clear both feet at the same time to score 2. Watch for inversion. If substantial inversion but forefeet are still lifted – score 1. If only inversion with lateral border of foot still on the ground score 0.
14. Jump	How high can you jump?	Standing on the floor, feet fairly close together.	Want height, not forward movement. Small amount of forward movement acceptable
15 & 16. Hop Right + Left leg	Can you hop on your right/left leg?	Starting position standing on floor on right leg. No shoes should be worn.	Needs obvious floor clearance to score 2
17. Run (10m)	Go as fast you can to.....(give point)	A straight 10m walkway should be clearly marked in a quiet space. Use a stop watch. Ensure safety of patient. They should self select speed after being asked to go 'as fast as they can'.	'Duchenne jog' - not a true run (there probably IS a double support phase), but more than a walk. Typically characterized by excessive use of arms, trunk rotation, substantial 'waddle'. No real 'push-off'

North Star Ambulatory Assessment - score sheet

Name:	Date:
Date of Birth:	Examiner name and signature:

Test Item	2	1	0	Comments
1. Stand	Stands upright, still and symmetrically, without compensation (with heels flat and legs in neutral) for minimum count of 3 seconds	Stands still but with some degree of compensation (e.g. on toes or with legs abducted or with bottom stuck out) for minimum count of 3 seconds	Cannot stand still or independently, needs support (even minimal)	
2. Walk	Walks with heel-toe or flat-footed gait pattern	Persistent or habitual toe walker, unable to heel-toe consistently	Loss of independent ambulation. May use KAFOs or walk short distances with assistance	
3. Stand up from chair	Keeping arms folded. Starting position 90° hips and knees, feet on floor/supported on a box step.	With help from thighs / push on chair / prone turn or alters starting position by widening base.	Unable	
4. Stand on one leg - right	Able to stand upright in a relaxed manner (no fixation) for count of 3 seconds	Stands but either momentarily or with trunk side-flexion or needs fixation e.g. by thighs adducted or other trick	Unable	
5. Stand on one leg - left	Able to stand upright in a relaxed manner (no fixation) for count of 3 seconds	Stands but either momentarily or with trunk side-flexion or needs fixation e.g. by thighs adducted or other trick	Unable	
6. Climb box step - right	Faces step – no support needed	Goes up sideways / rotates trunk / circumducts hip or needs support	Unable	
7. Climb box step - left	Faces step – no support needed	Goes up sideways / rotates trunk / circumducts hip or needs support	Unable	
8. Descend box step -right	Faces forward, steps down controlling weight bearing leg. No support needed	Sideways, skips down or needs support	Unable	
9. Descend box step -left	Faces forward, steps down controlling weight bearing leg. No support needed	Sideways, skips down or needs support	Unable	
10. Gets to sitting	Starts in supine – may use one hand / arm to push up	Uses two arms / pulls on legs or turns towards floor.	Unable	
11. Rise from floor	No evidence of Gowers' manoeuvre.	Exhibits at least one of the components described on page 2 – in particular rolls towards floor, and/or use hand(s) on legs	(a) NEEDS external support of object e.g. chair OR (b) Unable	Time (seconds) -- . --
12. Lifts head	In supine, head must be lifted in mid-line. Chin moves towards chest	Head is lifted but through side flexion or with no neck flexion (protracts)	Unable	
13. Stands on heels	Both feet at the same time, clearly standing on heels only (acceptable to move a few steps to keep balance) for count of 3	Only raises forefeet or only manages to dorsiflex one foot.	Unable	
14. Jump	Both feet at the same time, clear the ground simultaneously	One foot after the other (skip) or does not fully clear both feet at the same time.	Unable	
15. Hop right leg	Clears forefoot and heel off floor	Able to bend knee and raise heel, no floor clearance	Unable	
16. Hop left leg	Clears forefoot and heel off floor	Able to bend knee and raise heel, no floor clearance	Unable	
17. Run (10m)	Both feet off the ground (no double stance phase during running)	'Duchenne jog'.	Walk	Time (seconds) -- . --
				TOTAL= /34

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