Trunk Control Test: guidelines

Four movements/functions are tested, with the patient lying on the bed.

Rolling to weak side
From lying on back, rolling over on to weak side. May push/pull on bed with good arm.

Rolling to strong side
From lying on back, bringing weak limbs over
12 if uses good limbs to help

Sitting up from lying down
From lying on back—may use arm(s) to push or pull
12 if pulls on pole, rope, sheets, etc.

Sitting balance
Sitting on edge of bed, feet off ground—balance for 30 sec
12 if needs to touch anything with hands to stay upright
0 if unable to stay up (any way) for 30 sec

References Demeurisse *et al.* (1980); Parker *et al.* (1986); Wade, Langton, and Hewer (1987*b*); Sunderland *et al.* (1989); Collin and Wade (1990); Collen *et al.* (1990)

Comment
A short simple measure of motor loss primarily developed for use after stroke but probably useful in any patient with upper motor neuron weakness. Validity and reliability proven, and sensitive to change seen in recovery after stroke. Although not popular with traditional physiotherapists (and not intended to guide therapy), it is very useful in routine clinical practice. Strongly recommended.

Motor Assessment Scale

General instructions

1. The test should preferably be carried out in a quiet private room or curtained-off area.
2. The test should be carried out when the patient is maximally alert and not when under the influence of hypnotic or sedative drugs. Record if the patient is under the influence of sedative drugs.
3. Patient should be dressed in suitable street clothes with sleeves rolled up and without shoes and socks. Items 1 to 3 inclusive may be scored if necessary with the patient in his right clothes.

4. Each item is recorded on a scale of 0 to 6.
5. All items are to be performed independently by the patient unless otherwise stated. 'Stand-by help' means that the physical therapist stands by and may steady patient but must not actively assist.
6. Items 1 to 8 are recorded according to the patient's responses to specific instructions. General Tonus (item 9) is scored from continuous observations and handling throughout the assessment.
7. Patient should be scored on best performance. Repeat three times unless other specific instructions are given.
8. Because the scale is designed to score the patient's best performance, the physical therapist should give general encouragement but should not give specific feedback on whether response is correct or incorrect. Sensitivity to the patient is necessary to enable him to produce his best performance.
9. Instructions should be repeated and demonstrations given to the patient if necessary.
10. The order of administration of the items can be varied according to convenience.
11. If the patient becomes emotionally labile at any stage during scoring, the physical therapist should wait 15 sec before attempting the following procedures:
    - ask the patient to close his mouth and take a deep breath; and
    - hold the patient's jaw closed and ask the patient to stop crying.

    If patient is unable to control behaviour, the examiner should cease testing him and re-score this item and any other items unscored at a more suitable time.
12. If performance is scored differently on left and right side, the physical therapist may indicate this with an 'L' in one box and an 'R' in another box.
13. The patient should be informed when being timed.
14. You will need: a low, wide plinth, a stopwatch, a polystyrene cup, eight jelly-beans, two teacups, a rubber ball 14 cm (5-in) diameter, a stool, a comb, a top of a pen, a table, a dessert spoon and water, a pen, a prepared sheet for drawing lines, and a cylindrical object such as a jar.

A. *Supine to side lying on to intact side*

1. Pulls himself into side lying.
   Starting position must be supine lying, not knees flexed. Patient pulls himself into side lying with intact arm, moves affected leg with intact leg.
2. Moves leg across actively and lower half of body follows.
   Starting position as above. Arm is left behind.
3. Arm is lifted across body with other arm. Leg is moved actively and body follows in a block.
   Starting position as above.
4. Moves arm across body actively and rest of body follows in a block.
   Starting position as above.
5. Moves arm and leg and rolls to side but overbalances.
   Starting position as above. Shoulder protracts and arm flexes forward.

6. Rolls to side in 3 sec.
   Starting position as above. Must not use hands.

B. *Supine to sitting over side of bed*

1. Side lying, lifts head sideways but cannot sit up.
   Patient assisted to side lying.
2. Side lying to sitting over side of bed.
   Therapist assists patient with movement. Patient controls head position throughout.
3. Side lying to sitting over side of bed.
   Therapist gives stand-by help by assisting legs over side of bed.
4. Side lying to sitting over side of bed.
   With no stand-by help.
5. Supine to sitting over side of bed.
   With no stand-by help.
6. Supine to sitting over side of bed within 10 sec.
   With no stand-by help.

C. *Balanced sitting*

1. Sits only with support.
   Therapist should assist patient into sitting.
2. Sits unsupported for 10 sec.
   Without holding on, knees and feet together, feet can be supported on floor.
3. Sits unsupported with weight well forward and evenly distributed.
   Weight should be well forward at the hips, head and thoracic spine extended, weight evenly distributed on both sides.
4. Sits unsupported, turns head and trunk to look behind.
   Feet supported and together on floor. Do not allow legs to abduct or feet to move. Have hands resting on thighs, do not allow hands to move on to plinth.
5. Sits unsupported, reaches forward to touch floor, and returns to starting position.
   Feet supported on floor. Do not allow patient to hold on. Do not allow legs and feet to move, support affected arm if necessary. Hand must touch floor at least 10 cm (4 in) in front of feet.
6. Sits on stool unsupported, reaches sideways to touch floor, and returns to starting position.
   Feet supported on floor. Do not allow patient to hold on. Do not allow legs and feet to move, support affected arm if necessary. Patient must reach sideways, not forward.

D. *Sitting to standing*

1. Gets to standing position with help from therapist.
   Any method.

2. Gets to standing position with stand-by help.
   Weight unevenly distributed, uses hands for support.
3. Gets to standing position.
   Do not allow uneven weight distribution or help from hands.
4. Gets to standing position and stands for 5 sec with hips and knees extended.
   Do not allow uneven weight distribution.
5. Sitting to standing with no stand-by help.
   Do not allow uneven weight distribution. Full extension of hips and knees.
6. Sitting to standing with no stand-by help three times in 10 sec.
   Do not allow uneven weight distribution.

E. *Walking*

1. Stands on affected leg and steps forward with other leg.
   Weight-bearing hip must be extended. Therapist may give stand-by help.
2. Walks with stand-by help from one person.
3. Walks 3 m (10 ft) alone or uses any aid but no stand-by help.
4. Walks 5 m (16 ft) with no aid in 15 sec.
5. Walks 10 m (33 ft) with no aid, turns around, picks up a small sandbag from floor, and walks back in 25 sec.
   May use either hand.
6. Walks up and down four steps with or without an aid but without holding on to the rail three times in 35 sec.

F. *Upper-arm function*

1. Lying, protract shoulder girdle with arm in elevation.
   Therapist places arm in position and supports it with elbow in extension.
2. Lying, hold extended arm in elevation for 2 sec.
   Therapist should place arm in position and patient must maintain position with some external rotation. Elbow must be within 20 degrees of full extension.
3. Flexion and extension of elbow to take palm to forehead with arm as in 2 above.
   Therapist may assist supination of forearm.
4. Sitting, hold extended arm in forward flexion at 90 degrees to body for 2 sec.
   Therapist should place arm in position and patient must maintain position with some external rotation and elbow extension. Do not allow excess shoulder elevation.
5. Sitting, patient lifts arm to above position, holds it there for 10 seconds, and then lowers it.
   Patient must maintain position with some external rotation. Do not allow pronation.
6. Standing, hand against wall. Maintain arm position while turning body towards wall.
   Have arm abducted to 90 degrees with palm flat against the wall.

G. *Hand movements*

1. Sitting, extension of the wrist.
   Therapist should have patient sitting at table with forearm resting on the table. Therapist places cylindrical object in palm of patient's hand. Patient is asked to lift object off the table by extending the wrist. Do not allow elbow flexion.
2. Sitting, radial deviation of wrist.
   Therapist should place forearm in midpronation–supination (i.e. resting on ulnar side, thumb in line with forearm and wrist in extension, fingers around a cylindrical object). Patient asked to lift hand off table. Do not allow elbow flexion or pronation.
3. Sitting, elbow into side, pronation and supination.
   Elbow unsupported and at a right angle. Three-quarter range is acceptable.
4. Reach forward, pick up large ball of 14 cm (5-in) diameter with both hands and put it down.
   Ball should be on table so far in front of patient who has to extend arms fully to reach it. Shoulders must be protracted, elbows extended, wrist neutral or extended. Palms should be kept in contact with the ball.
5. Pick up a polystyrene cup from table and put it on table across other side of body.
   Do not allow alteration in shape of cup.
6. Continuous opposition of thumb and each finger more than 14 times in 10 sec.
   Each finger in turn taps the thumb, starting with index finger. Do not allow thumb to slide from one finger to the other, or to go backwards.

H. *Advanced hand activities*

1. Picking up the top of a pen and putting it down again.
   Patient stretches arm forward, picks up pen top, releases it on table close to body.
2. Picking up one jellybean from a cup and placing it in another cup.
   Teacup contains eight jellybeans. Both cups must be at arms' length. Left hand takes jellybean from cup on right and releases it in cup on left.
3. Drawing horizontal lines to stop at a vertical line 10 times in 20 sec.
   At least five lines must touch and stop at the vertical line.
4. Holding a pencil, making rapid consecutive dots on a sheet of paper.
   Patient must do at least two dots a second for 5 sec. Patient picks pencil up and positions it without assistance. Patient must hold pen as for writing. Patient must make a dot and not a stroke.
5. Taking a dessert spoon of liquid to the mouth.
   Do not allow head to lower towards spoon. Do not allow liquid to spill.
6. Holding a comb and combing hair at back of head.

I. *General tonus*

1. Flaccid, limp, no resistance when body parts are handled.
2. Some response felt as body parts are moved.
3. Variable, sometimes flaccid, sometimes good tone, sometimes hypertonic.
4. Consistently normal response.
5. Hypertonic 50 per cent of the time.
6. Hypertonic at all times.

References Carr *et al.* (1985); Poole and Whitney (1988); Loewen and Anderson (1988)

Comment

Eight hierarchical measures largely focused on disability (the assessment of tone is of impairment, but it is unreliable). Although well studied, with good support for validity and reliability, it is a long test. Gaining some popularity in research protocols.

Modified Ashworth Scale for grading spasticity

Grade	Description
0	No increase in muscle tone.
1	Slight increase in muscle tone, manifested by a catch and release, or by minimal resistance at the end of the range of motion when the affected part(s) is moved in flexion or extension.
2	Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the range of movement (ROM).
3	More marked increase in muscle tone through most of ROM, but affected part(s) easily moved.
4	Considerable increase in muscle tone, passive movement difficult.
5	Affected part(s) rigid in flexion or extension.

Reference Bohannon and Smith (1987)

Comment

The only assessment of abnormal tone caused by upper motor neuron damage to have been formally evaluated. It has face validity, but the