Trunk Control Measurement Scale (TCMS)

Test instructions

Orthoses, shoes and/or a trunk brace should be taken off.
The starting position is the same for each item. The patient is sitting on the edge of a treatment table without back, arm or feet support. The thighs make full contact with the table.
The hands rest on the legs, close to the body. The patient is asked to sit upright at the start of each item and needs to be encouraged to maintain the upright position during the performance of the task. The term 'upright' refers to the most upright sitting position that the child can assume. This position can differ from child to child. This position is the reference position for identification of aberrations in performance and/or compensations.
Each item is performed three times. The best performance is taken into account for scoring.
If the child performs the tasks of subscale 'static sitting balance' with single arm support, only support with the hand flat on the table without grasping is allowed.

Item	STATIC SITTING BALANCE Testing procedure: Each item is verbally explained to the patient and demonstrated by the tester if needed.		Bilat/ Left	Right
1	Starting position (unsupported sitting, hands on legs) **Patient is instructed to sit upright and hold this position for 10 seconds**	Patient falls or can only maintain upright sitting with double arm support	□ 0	
		Patient can only maintain upright sitting with single arm support for 10 sec	□ 1	
		Patient can maintain upright sitting without arm support for 10 sec	□ 2	
		If score = 0, then total score = 0		
2	Starting position **Patient lifts both arms at eye height in one second and returns to starting position**	Patient falls or can not lift arms	□ 0	
		Patient can lift arms without falling but with compensations. Possible compensations are: (1) backward lean, (2) increase of trunk flexion, (3) lateral flexion, (4) other	□ 1	
		Patient lifts arms without compensations	□ 2	
3	Starting position **Therapist crosses one leg over the other leg**	Patient falls, can not cross legs or can only maintain sitting with double arm support	□ 0	□ 0
		Patient can maintain sitting with single arm support for 10 sec	□ 1	□ 1
		Patient can maintain sitting without arm support for 10 sec	□ 2	□ 2
4	Starting position **Patient crosses one leg over the other leg (assistance with one hand is allowed)** 'minimal' = small trunk movements without signs of imbalance of trunk during movement of leg 'clear' = clear signs of imbalance i.e. lateral flexion or flexion of trunk	Patient falls, can not cross legs or can only cross legs with double arm support	□ 0	□ 0
		Patient can only cross legs with single arm support	□ 1	□ 1
		Patient crosses legs without arm support but with clear trunk displacement	□ 2	□ 2
		Patient crosses legs with minimal trunk displacement	□ 3	□ 3

5	Starting position **Patient abducts one leg over 10 cm and returns to starting position** (10 cm width=width of the knee) 'minimal' = small trunk movements without signs of imbalance of trunk during movement of leg 'clear' = clear signs of imbalance i.e. lateral flexion or flexion of trunk			
		Patient falls, can not abduct leg or can only abduct leg with double arm support	□ 0	□ 0
		Patient can only abduct leg with single arm support	□ 1	□ 1
		Patient abducts leg without arm support but with clear trunk displacement	□ 2	□ 2
		Patient abducts leg with minimal trunk displacement	□ 3	□ 3

Total static sitting balance   **/20**

DYNAMIC SITTING BALANCE

Selective movement control

Testing procedure: First, each item is verbally explained and demonstrated by the tester. Secondly, the item is demonstrated on the patient with manual guidance. Thirdly, the patient is asked to perform the expected movement under manual guidance of the tester. Then, the patient performs the item on its own in three attempts.

			Bilat/ Left	Right
6a	Starting position - arms crossed over chest **Patient is instructed to lean forward with a fixed trunk for approximately 45° and return to starting position** normal righting reaction of the head i.e. limited head extension is not scored as a compensation	Patient falls or can not reach target position	□ 0	
		Patient can lean forward	□ 1	
		If score = 0, then item 6b = 0		
6b		Patient compensates (1) increased head extension, (2) increased trunk flexion, (3) increased lumbar lordosis, (4) increased knee flexion, (5) other	□ 0	
		Patient leans forward without compensations	□ 1	
7a	Starting position - arms crossed over chest **Patient is instructed to lean backward with a fixed trunk for approximately 45° and return to starting position** normal righting reaction of the head i.e. limited head flexion is not scored as a compensation	Patient falls or can not reach target position	□ 0	
		Patient can lean backward	□ 1	
		If score = 0, then item 7b = 0		
7b		Patient compensates (1) increased head flexion, (2) increased trunk flexion, (3) increased knee extension, (4) other	□ 0	
		Patient leans backward without compensations	□ 1	
8a	Starting position **Patient is instructed to touch the table with the elbow at level of the femoral head (by shortening the ipsilateral side and lengthening the contralateral side) and return**	Patient falls or does not touch the table with the elbow	□ 0	□ 0

	to starting position			3
		Patient can touch the table with the elbow	□ 1	□ 1
		If score = 0, then item 8b and 8c = 0		
8b		Patient demonstrates (1) no shortening/lengthening or (2) opposite shortening/lengthening	□ 0	□ 0
		Patient demonstrates expected shortening/lengthening	□ 1	□ 1
		If score = 0, then item 8c = 0		
8c		Patient compensates: (1) increased trunk flexion, (2) forward or backward lean, (3) pelvic lift, (4) other	□ 0	□ 0
		Patient touches the table without compensations	□ 1	□ 1
9a	Starting position **Patient is instructed to lift the pelvis at one side and return to starting position.** No lifting of the thigh is allowed.	Patient falls or can not lift the pelvis	□ 0	□ 0
		Patient can lift the pelvis	□ 1	□ 1
		If score = 0, then item 9b and 9c = 0		
9b		Patient demonstrates no shortening/lengthening Patient demonstrates partially expected shortening/lengthening (partial = short and/or small ROM)	□ 0 □ 1	□ 0 □ 1
		Patient demonstrates expected shortening/lengthening	□ 2	□ 2
		If score = 0, then item 9c = 0		
9c		Patient compensates: (1) contralateral head flexion, (2) marked lateral trunk displacement, (3) other	□ 0	□ 0
		Patient lifts the pelvis without compensations	□ 1	□ 1
10a	Starting position - arms crossed over chest **Patient is instructed to rotate the upper trunk three times with head fixated in starting position.** The movement is initiated from the shoulder girdle.	Patient (1) falls, (2) can not rotate the upper trunk i.e. patient can not perform the rotation movement, even not with the entire trunk, or (3) demonstrates no selective rotation of the upper trunk (en bloc)	□ 0	
		Patient demonstrates partial selective rotation of the upper trunk (partial = asymmetrical, small ROM, more shoulders than trunk)	□ 1	
		Patient demonstrates expected selective rotation of the upper trunk	□ 2	
		If score = 0, then item 10b = 0		
10b		Patient rotates the upper trunk with head rotation	□ 0	
		Patient rotates the upper trunk without head rotation	□ 1	
11a	Starting position - arms crossed over chest **Patient is instructed to rotate the lower trunk three times with head fixated in starting position.** The movement is initiated from the pelvic girdle.	Patient (1) falls, (2) can not rotate the lower trunk i.e. patient can not perform the rotation movement, even not with the entire trunk, or (3) demonstrates no selective rotation of the lower trunk (en bloc)	□ 0	
		Patient demonstrates partial selective rotation of the lower trunk (partial = asymmetrical, small ROM, additional movement of upper trunk)	□ 1	
		Patient demonstrates expected selective rotation of the lower trunk	□ 2	

	If score = 0, then item 11b = 0		
11b	Patient compensates with pelvic tilt	□ 0	
	Patient rotates the lower trunk without compensations	□ 1	
12a	**Starting position - arms crossed over chest** **Patient is instructed to <u>shuffle the pelvis three times</u> in a <u>forward</u> direction and return <u>backwards</u> in three times to the starting position** shuffle movement=combination of lateral flexion and rotation with the pelvis, alternated left and right		
	Patient falls or can not shuffle the pelvis in forward and backward direction i.e. no displacement of the body in either direction	□ 0	
	Patient can partially shuffle the pelvis (partial = with mainly lateral flexion and little rotation; small ROM; takes a lot of effort)	□ 1	
	Patient can shuffle the pelvis by use of both lateral flexion and rotation in one direction and partially in the other direction	□ 2	
	Patient can shuffle the pelvis by use of both lateral flexion and rotation in both directions	□ 3	
	If score = 0, then item 12b = 0		
12b	Patient compensates with excessive trunk displacement	□ 0	
	Patient shuffles pelvis without compensations	□ 1	

Total selective movement control /28

	Dynamic reaching (equilibrium reactions) Testing procedure: Each item is verbally explained by the tester and then performed three times by the patient.	Bilat/ Left	Right
13	**Starting position - arms straight forward** **Patient is instructed to <u>reach forward</u> with <u>both arms straight</u> to target at eye level positioned at a distance, corresponding with the forearm length and return to starting position**		
	Patient falls or can not reach target	□ 0	
	Patient reaches target, but has difficulties in performance. Difficulties are: (1) takes a lot of effort i.e. slow and with difficulty or (2) uses some support of hand when approaching the starting position	□ 1	
	Patient reaches target and returns to starting position without difficulties	□ 2	
14	**Starting position - one arm straight sideward and other hand on leg** **Patient is instructed to <u>reach sideward</u> with one arm straight to target at eye level positioned at a distance, corresponding with the forearm length and return to starting position**		
	Patient falls or can not reach target	□ 0	□ 0
	Patient reaches target, but has difficulties in performance. Difficulties are: (1) takes a lot of effort i.e. slow and with difficulty or (2) uses some support of hand when approaching the starting position	□ 1	□ 1
	Patient reaches target and returns to starting position without difficulties	□ 2	□ 2

15	Starting position - one arm straight sideward and other hand on leg **Patient is instructed to <u>reach across the midline</u> with one arm (reach to the opposite side) and return to starting position.** The target is positioned at eye level at a distance corresponding with half the forearm length of the reaching arm.			
		Patient falls or can not reach target	□ 0	□ 0
		Patient reaches target, but has difficulty in performance. Difficulties are: (1) takes a lot of effort i.e. slow and with difficulty or (2) uses some support of hand when approaching the starting position	□ 1	□ 1
		Patient reaches target and returns to starting position without difficulties	□ 2	□ 2

Total dynamic reaching **/10**

TOTAL TCMS score **/58**

Reference:

Heyrman L, Molenaers G, Desloovere K, Verheyden G, De Cat J, Monbaliu E, Feys H. A clinical tool to measure trunk control in children with cerebral palsy: the Trunk Control Measurement Scale. Research in Developmental Disabilities 2011; 32(6):2624-2635.