

TASC Manual and Scoresheet Printing Suggestions

The manual (pages 2-21 of this packet) is meant to be printed in “booklet” form so that the final form is 8.5x5.5 inches in size (achieved by folding the printed packet in half). Alternatively, it can be printed on a regular page if your printer does not have a booklet option, but the size may seem large.

The score sheet is to be printed as a full sheet, so select pages 22-23 to be printed in regular form, double-sided if you wish for easy reference.

Test of Arm Selective Control (TASC)

Administration Manual

The Test of Arm Selective Control (TASC) was developed to quantify the extent to which children with cerebral palsy (CP) have selective voluntary motor control. This was defined by the Taskforce as “the impaired ability to isolate the activation of muscles in a selected pattern in response to demands of a voluntary posture or movement.” [1] The TASC can be used in clinic or research settings. Although notation of impairments related to spasticity and dystonia should be made on the scoring sheet, TASC is not intended to test for these impairments, and is not a discriminative tool.

Psychometric Properties

The TASC has been content-examined by an expert panel of clinicians. In addition, we solicited feedback regarding the clarity of the manual from all clinicians who were formally trained on the measure.

Validity

A sample of 56 individuals with diplegic, hemiplegic and quadriplegic CP, ages 5-18 and GMFCS levels I-IV, were evaluated using the TASC. There was a significant correlation between the TASC total score and the MACS level ($r=-0.529$, $p<0.001$), the number of upper extremities affected according to their CP diagnosis ($r=-0.486$, $p=0.001$), and Abilhand-Kids Logit score ($r=0.596$, $p<0.001$). Age of patient and rater did not influence TASC score ($p=0.366$ and $p=0.713$, respectively). The average administration time in this group was 16.3 minutes.

Reliability

Two groups of 3 raters each evaluated 17 children with diplegic, hemiplegic and quadriplegic CP, aged 6-18 years and GMFCS levels I-IV, using the TASC and scored in real time. High degrees of inter-rater reliability were found in both groups. The ICC (2,3) were 0.943 and 0.944 for total scores ($p<0.001$ in both), and ranged between 0.916 and 0.958 when comparing limb scores in each group. Internal consistency was also high ($\alpha =0.943$), suggesting a unidimensional construct for test items.

[1] Sanger T, Chen D, Delgado MR, Gaebler-Spira D, Hallett M, Mink JW, Taskforce on Childhood Motor Disorders. Definition and Classification of Negative Motor Signs in Childhood. Pediatrics Nov 2006, 118 (5) 2159-2167; DOI: 10.1542/peds.2005-3016

Considerations for testing:

Environment -- To administer the TASC, select a location where distractions are minimized. Document the seating (type of chair, if there was a backrest, etc) used for the examination, and components of testing environment that might be important for a given patient for re-test purposes (location, others present, time of day, etc).

Patient characteristics. The TASC is for children with cerebral palsy who are at least 4 years old. The patient must be able to follow simple motor commands, behaviorally attend to tasks, and demonstrate ability to be adequately instructed in intended movements (for example, considerations would need to be made if someone were unable to see motions they were being asked to do).

General Directions:

1. It is suggested to organize the test from proximal to distal (starting from item 1), evaluating the less impaired side first for each test item. This order can be modified as needed.
2. Examiner instructs the patient in the motion, and then demonstrates the item to be performed by passively moving the limb through the movement within 3 seconds, spending 1 second on each component of the test item.
3. Note approximate passive range of motion (PROM) for comparison with the observed range during the patient's active effort, and if there is a spastic catch present.
4. Ask the patient to perform the desired motion at a speed of 3 seconds or less (it is suggested auditory cues are provided with single words that describe the motion, as suggested the gray box of each item's description) without moving other joints in the same limb or the contralateral limb. A metronome may be used for cuing appropriate speed. Each joint is scored as a 0, 1, or 2, as defined for each item.
5. If the patient is initially unsuccessful (score of 1 or 0), provide feedback and repeat. Up to 3 total attempts are allowed.
6. Instructions or verbal cues may be modified to maximize patient performance.
7. If the patient scores a 1 (impaired) or 0 (absent), place a check mark in the appropriate descriptor box(es) to describe reason for score.

Each joint is scored as a 0, 1, or 2. The joints of each limb are summed for a limb score, and the right and left sides are added for a total score. The maximum score is 16 per side, or 32 points in total.

Scoring definitions:

Normal = 2

Normal motor control is the ability to isolate joint motion through more than 50% of the available range of motion (ROM) in instructed directions within a three-second verbal count. The motion occurs without accompanying motion at any other joints of either limb. In general, when descriptors are checked on the score sheet a patient cannot have normal motor control.

Impaired = 1

Patients with impaired motor control may be able to move the desired joint through a portion of the available ROM ($\leq 50\%$) without any other joint movement, however a portion of the motion is accompanied by motion at a different joint of the same limb, or mirrored by motion on the opposite limb.

Absent = 0

If a patient does not demonstrate selective voluntary motor control, they have simultaneous movement at two or more joints. For every degree of motion at the desired joint, concomitant obligatory motion occurs at another joint in the limb. This movement may occur in the defined synergy patterns, but does not have to. A score of 0 is also given if a patient is unable to actively generate any ROM at the instructed joint.

Score Sheet Descriptors

↓ ROM: Active motion \leq 50% available ROM at joint being tested.

Slow: Motion occurs slower than verbal cues given by examiner (3 second count).

Extra movement: Movement at joints other than tested joints within the same arm, or in postural compensations at the trunk.

Mirror movements: Mirroring noted in arm opposite tested arm.

No palpable contraction: No palpable contraction of the agonist muscles to instructed joint movements.

Movement one direction: Movement in only one of the instructed directions (note motion achieved).

Muscle Properties

Spastic catch: Passive resistance or catch is felt when the joint is moved with increased speed while the patient is relaxed. This is assessed while the examiner is determining PROM.

Muscle tightness: The joint has a contracture or PROM limitation.

Notes Section

Flexion synergy influence: Coupling of movements that may include some or all of the following: shoulder abduction, elbow flexion, forearm supination, and wrist/finger flexion.

Extension synergy influence: Coupling of movements that may include some or all of the following: shoulder adduction, elbow extension, forearm pronation, and wrist/finger flexion.

TASC scoresheet:

TASC: Test of Arm Selective Control, Patient ID: _____ Date: _____

DOB: _____ GMFCS: I II III IV V MACS: I II III IV V

Diagnosis: right hemiplegia left hemiplegia diplegia quadriplegia other _____

Administration: time (min) _____

seating _____

environment _____

LEFT	SCORE 2=normal 1=impaired 0=absent	Muscle properties		Descriptors					
		spastic catch	muscle tightness	↓ROM ≤50%	slow	extra mvmt	mirror mvmts	no palp contract	mvmt one direction
Shoulder Abduction/Adduction									
Shoulder Flexion/Extension									
Elbow Flexion/Extension									
Forearm Supination/Pronation									
Wrist Extension/Flexion									
Finger Flexion/Extension									
Thumb Opposition (tip to tip pincer)									
Thumb extension (key grip)									
TOTAL									

RIGHT	SCORE 2=normal 1=impaired 0=absent	Muscle properties		Descriptors					
		spastic catch	muscle tightness	↓ROM <50%	slow	extra mvmt	mirror mvmts	no palp contract	mvmt one direction
Shoulder Abduction/Adduction									
Shoulder Flexion/Extension									
Elbow Flexion/Extension									
Forearm Supination/Pronation									
Wrist Extension/Flexion									
Finger Flexion/Extension									
Thumb Opposition (tip to tip pincer)									
Thumb extension (key grip)									
TOTAL									

General observations/Notes:

- flexion synergy influence _____
- extension synergy influence _____
- cannot maintain neutral wrist _____
- other _____

BOTH STARTING POSITIONS

- Participant sits in a chair without arms, or on a bench, or in a wheelchair with armrests removed.
- Posture is as upright as possible with back support as necessary.
- Contralateral (untested) arm should rest in lap.
- Feet should be well supported with knees and hips at approximately 90 degrees.

Starting Position 1 (Items 1-3)



- Shoulder in neutral (no flexion, abduction, or rotation)
- Elbow extended, forearm neutral
- Wrist neutral
- Fingers extended

**In the case of muscle tightness or contracture, patients should be scored based on the presence or absence of selective motor control within their available ROM. When there is tightness or contracture in the wrist flexors that prevents the patient from achieving the prescribed wrist position for a test item, the wrist must be actively held at the end of their available range for assessment.

Starting Position 2 (Items 4-8)



- Shoulder in neutral (no flexion, abduction, or rotation)
- Elbow at 90 degrees, forearm neutral. The examiner can provide tactile cues and minimal support at the patient's proximal forearm to maintain the start position as needed. If providing support, the examiner both watches and feels for unintended movements at the initiation of and during the test item performance that would be indicative of impaired or absent selective motor control.
- Wrist neutral
- Fingers vary depending on task

Item 1: SHOULDER ABDUCTION/ADDUCTION

Position	Starting position 1
Instructions to patient	“Raise your arm to the side as high as you can [with the palm of your hand facing down], bring it down, and then raise it again. Try to keep your elbow, wrist and fingers straight while you do this.”
Score = 2	Abducts, adducts, and abducts again. During abduction, movement occurs without shoulder flexion or rotation, or elbow, forearm, wrist, or finger movement and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: abducts $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not abduct at the shoulder, or only does so with associated elbow flexion, forearm rotation, or wrist or finger flexion/extension.



“down”



(midrange)



“up”

“UP, DOWN, UP”

Item 2: SHOULDER FLEXION/EXTENSION

Position	Starting position 1
Instructions to patient	“Raise your arm to the front as high as you can, [with your thumb pointing to the ceiling], bring it down, and then raise it again. Try to keep your elbow, wrist and fingers straight while you do this.”
Score = 2	Flexes, extends, and flexes again. During flexion, movement occurs without shoulder abduction or rotation, or elbow, forearm, wrist, or finger movement and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: flexes $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not flex at the shoulder, or only does so with associated elbow flexion, forearm rotation, wrist flexion or finger flexion/extension.



“down”



(midrange)



“up”

“UP, DOWN, UP”

Item 3: ELBOW FLEXION/EXTENSION

Position	Starting position 1
Instructions to patient	“Bend your elbow to bring your hand up as far as you can [while your thumb points towards the ceiling], straighten your elbow and then bend it again.”
Score = 2	Flexes, extends, and flexes again. During flexion, movement occurs without shoulder, forearm, wrist, or finger flexion/extension or rotation and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: extends $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not flex or extend at the elbow, or only does so with forearm, wrist, hand or shoulder movement.



“down”



“up”

“UP, DOWN, UP”

Item 4: FOREARM SUPINATION/PRONATION

Position	Starting position 2. Fingers can be held either flexed or extended as long as the position of the fingers is consistent throughout.
Instructions to patient	“Turn your hand so that I can see the inside of your hand, the back of your hand and then the inside of your hand again.”
Score = 2	Supinates, pronates, and supinates again. During supination, movement occurs without shoulder, elbow, wrist, or finger movement and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: supinates or pronates $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not supinate or pronate at the forearm, or only does so with shoulder, elbow, wrist or hand motion.

Start



“up”



“down”

“UP, DOWN, UP”

Item 5: WRIST EXTENSION/FLEXION

Position	Starting position 2. Fingers can be held either flexed or extended as long as the position of the fingers is consistent throughout.
Instructions to patient	“Move your wrist so you hand comes out, in, and then out again.”
Score = 2	Extends, flexes, and extends again. During extension, movement occurs without forearm, elbow or shoulder movement, and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: extends $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not extend at the wrist, or only does so with forearm, hand, elbow and/or shoulder movement.



“OUT, IN, OUT”

Item 6: FINGER and THUMB FLEXION/EXTENSION

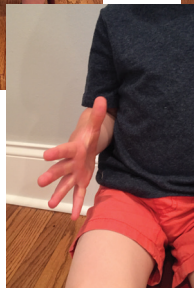
Position	Starting position 2.
Instructions to patient	“Open your hand wide, make your hand into a fist, and then open it wide again.”
Score = 2	Extends, flexes and extends again. During extension, movement occurs without forearm, elbow or shoulder movement and within a 3 second count and without mirror movement. Small amounts of wrist motion may be present, as would be typical in a power grip.
Score = 1	One or more of the following occur: extends $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not extend at the fingers/thumb, or only does so with forearm, elbow and/or shoulder movement.

Start



“close”

“open”



“OPEN, CLOSE, OPEN”

Item 7: THUMB OPPOSITION (thumb-first finger tip-to-tip)

Position	Starting position 2. Digits 3-5 may be maintained in some flexion, or full extension.
Instructions to patient	“Move your thumb and index finger together to make a circle like this [demo]. Straighten your thumb and finger out. Make a circle again.”
Score = 2	Opposes thumb and index finger into a fine pincer grasp, extends digits and opposes again. During opposition, movement occurs without shoulder, elbow, forearm, or wrist movement and within a 3 second count and without mirror movement. Some natural finger flexion (minimal) may be seen in digits 3-5, but should be passive only.
Score = 1	One or more of the following occur: opposes $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not oppose the index finger/thumb, or only does so with wrist, finger, forearm, elbow and/or shoulder movement.



“CLOSE, OPEN, CLOSE”

Item 8: THUMB EXTENSION (key grip)

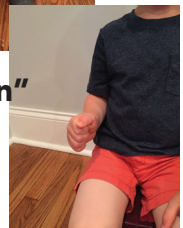
Position	Starting position 2. Fingers are gently flexed into fist with thumb abducted and resting on lateral surface of index finger.
Instructions to patient	“Keep your fingers flexed and your thumb straight. Lift your thumb up, down and up.”
Score = 2	Extends, flexes and extends again. During extension, movement occurs without finger, wrist, forearm, elbow or shoulder movement and within a 3 second count and without mirror movement.
Score = 1	One or more of the following occur: extends $\leq 50\%$ of available ROM, performs task slower than 3 second count, movement occurs only in one direction, or motion at another joint (including mirror movements) occurs.
Score = 0	Does not extend at the thumb, or only does so with finger, wrist, forearm, elbow and/or shoulder movement.



“up”



“down”



“UP, DOWN, UP”

TASC Manual

The Test of Arm Selective Control (TASC) was developed as a collaborative effort stemming from the NIH Taskforce on Childhood Movement Disorders. The test was developed by Kristin Krosschell, PT, DPT, MA, PCS; Theresa Sukal-Moulton, PT, DPT, PhD; and Deborah Gaebler-Spira, MD with critical input from Darcy Fehlings, MD and Eileen Fowler, PT, PhD. The project was funded in part by the NIH Taskforce on Childhood Movement Disorders.

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TASC: Test of Arm Selective Control, Patient ID: _____

Date: _____

DOB: _____ GMFCS: I II III IV V MACS: I II III IV V

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 seating _____
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