Pediatric Physical Therapy Functional Outcome Measures

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Objectives:

Upon completion of the course, participants will be able to:

- Define functional outcome measures.
- Differentiate functional outcome measures from standardized pediatric assessments.
- Identify common functional outcome measures utilized in pediatric physical therapy practice that correlate to each level of the ICF model.
- Describe the administration of selected pediatric functional outcome measures.
- Discuss interpretation of pediatric functional outcome measure data, in relationship to current available evidence.
- Utilize selected pediatric functional outcome measures in clinical practice.

Functional Outcome Measures

"Outcome measures quantify the changes and impairments in body functions and structures, activity limitations, and participation restrictions, and the changes in health, wellness, and fitness that are expected as the result of patient/client management."

(Physical Therapy Practice, 2014)

Types of Functional Outcome Measures

- Performance-Based – patient performs a set of functional tasks (ex: TUG)
- Self-Report – patient or caregiver completes a questionnaire, rating overall performance on a predetermined set of functional tasks (ex: PEM-CY)

Standardized Pediatric Assessments

- Do not serve the same purpose as functional outcome measures
- Often required for eligibility for PT services
- Used to compare individual to peers (norm-referenced) or to himself (criterion-referenced)
- Norm-referenced tests are not usually sensitive to the effect of intervention

Why Should We Use Functional Outcome Measures?

- Quantify baseline performance
- Support need for physical therapy services
- Aid in goal setting
- Guide treatment plan
- Provide justification for treatment
- Assess progress
- Quantify change in response to intervention

Things to Consider When Selecting Functional Outcome Measures

- Goals of family/child
- Environment and equipment needs
- Purpose of test
- Clinical utility
- Psychometric properties

Reliability

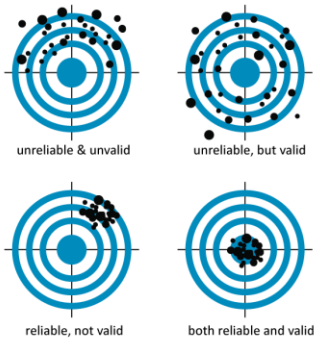
- Repeatable, consistent results

Inter-rater Reliability	Agreement between two or more raters
Intra-rater Reliability	Consistency between the same rater on two or more trials
Test-retest Reliability	Repeatability of test results across multiple administrations on same subject
Internal Consistency	Correlation between different items on the same test; indicates how well the items measure the same construct

Validity

- Does the test measure what it is designed to measure?

Content	How well test items represent the theoretical basis of the trait measured
Criterion	How well the test correlates with another test (typically a Gold Standard)
Convergent	How well a test correlates with another test that measures the same thing
Predictive	Extent to which a variable can accurately predict a given outcome



(Barfod, 2014)

Responsiveness

- Minimal Detectable Change (MDC) – considered the minimal amount of change that is not likely due to chance
- Minimal Clinically Important Difference (MCID) – smallest change measured that can be interpreted as meaningful change

Physical Therapy Practice, 2014)

Clinical Utility

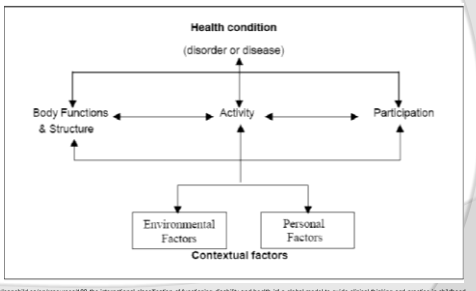
- Appropriateness of the outcome measure for the setting and individual
- Precision of the outcome measure to accurately measure change
- Interpretability of the outcome measure to the situation
- Resources required to administer the outcome measure

...to Physical Therapy Practice, 2014.

Interpretation of Correlation Values

Little/None	.00-.25
Low	.26-.49
Moderate	.50-.69
High	.70-.89
Very High	.90-1.00

The International Classification of Functioning Disability and Health (ICF) Model



https://canchild.ca/en/resources/182-the-international-classification-of-functioning-disability-and-health-icf-a-global-model-to-guide-clinical-thinking-and-practice-in-childhood-disability

Functional Outcome Measures

- 30-Second Walk Test
- 6-Minute Walk Test
- 10-Meter Walk Test
- 10-Meter Run Test
- 30' Shuttle Run
- 5 Times Sit to Stand
- Pediatric Balance Scale
- Pediatric Clinical Test of Sensory Interaction of Balance
- Functional Reach Test
- Timed Up and Go
- Timed Floor to Stand – Natural
- Timed Up and Down Stairs
- Participation and Environment Measure – Children and Youth
- PROMIS Measures

BODY STRUCTURE & FUNCTION

30-Second Walk Test (30sWT)

Purpose:	Used to measure the number of feet a child can walk in 30 seconds. Scores can easily be converted to walking velocity.
Equipment:	Stopwatch, measuring wheel, 4 cones, tape, open area with taped 6' x 8' oval course
Set-Up:	Round off corners of open area (place tape in rounded arc starting 8' from corner). Place cones at each corner to demarcate. Place piece of tape on floor for starting line.
Directions:	Child stand with feet behind the taped starting line. "When I say go, walk around the room, like a line leader, until I say 'freeze'. Keep within the cones. Walk, don't run. 1, 2, 3, GO!"
Scoring:	At the end of 30' seconds, place piece of tape at the most advanced part of the foot in contact with the floor. Measure the distance from the starting line to the end of the tape using the measuring wheel. Record distance.

30-Second Walk Test Reference Data

Age (years)	Male Mean (SD), ft	Female Mean (SD), ft
5	133.9 (20.6)	127.4 (19.9)
6	141.7 (21.3)	138.4 (19.7)
7	144.6 (17.6)	140.8 (19.4)
8	153.4 (22.4)	145.1 (19.5)
9	157.5 (18.4)	149.6 (18.7)
10	167.4 (20.6)	160.3 (16.9)
11	162.5 (19.4)	156.5 (17.8)
12	154.4 (19.9)	150.7 (18.7)
13	151.0 (16.8)	145.7 (16.5)

(Lieberstein et al, 2018)

Reliability & Clinical Utility

Typical Development

- Test-retest reliability – strong correlation between two trials (r=0.965)
- 30sWT is a quick assessment used to measure the distance a child can walk in a short period of time
- Shorter leg length may account for less distance walked by younger children; behavioral states my affect results in 11-14 year olds (Lieberstein et al)
- Reference values can be used evaluate a child's performance and may aid in the identification of limitations that impact walking ability.

6-Minute Walk Test (6-MWT)

Purpose:	Used to assess functional exercise capacity for cardiovascular endurance
Equipment:	Stopwatch, digital pulse oximeter, tape, measuring wheel, hallway at least 15 meters long
Set-Up:	Place tape to mark starting line. Child begins in standing behind tape.
Directions:	Refer to American Thoracic Society guidelines. Child begins at the starting line and timing and walking begin on the command, "GO." Standard encouraging phrases can be provided at 30 second intervals, and the child is informed of remaining time at each minute mark. At the end of 6 minutes, tell the child to, "stop and do not move until I come to you. Place tape in line with the child's toes to mark their distance of the final, partial lap. Calculate distance.
Scoring:	Record total distance walked; round meters to 2 decimal places.

6 Minute Walk Test Video

6-MWT Reference Data

Age (years)	Mean ± SD (m)
7-8	527.09 ± 64.02
9	531.66 ± 80.27
10	497.15 ± 66.81
11	533.63 ± 85.42

(Klepper & Muir, 2011)

6-MWT Reference Data

Group	6-MWT (SD)
GMFCS I CP	439.57 (49.81)
GMFCS II CP	386.74 (66.47)
GMFCS III CP	305.28 (66.95)
Typical Development	528.42 (67.77)

(Fitzgerald, et al, 2016)

Reliability

Down Syndrome

Responsiveness & Clinical Utility

Typical Development

Cerebral Palsy

walked
es than TD peers

10-Meter Walk Test

Purpose:	Used to assess normal-paced walking speed
Equipment:	Stopwatch, tape measure, tape
Set-Up:	Mark off 10 meters with 2 pieces of tape (starting line and finish line). Place additional pieces of tape at 2 meters before the starting line and 2 meters past the finish line.
Directions:	Timing begins when the child reaches the starting line and ends when the child crosses the finish line. "When I say go, walk from the starting line to the finish line. Walk, don't run. 1, 2, 3, GO!"
Scoring:	Record the time it takes the child to walk the 10 meters that are measured. Do not account for the acceleration and deceleration time.

10-Meter Timed Portion

10-Meter Walk Test Reference Data

Age (years)	Mean Score ± SD (sec)
2	13.14 ± 2.06
3	12.05 ± 1.86
4	11.07 ± 2.39
5	10.35 ± 1.77
6	10.11 ± 2.36
7	9.85 ± 2.05
8	9.95 ± 1.84
9	9.91 ± 2.12
10	10.49 ± 1.86
11	9.32 ± 1.51
12	9.42 ± 1.63

(Pereira, et al, 2016)

10-Meter Run Test

Purpose:	Used to assess running speed, agility, coordination
Equipment:	Stopwatch, tape measure, tape
Set-Up:	Mark off 10 meters with 2 pieces of tape (starting line and finish line)
Directions:	The child begins with toes on the starting line, facing the finish line. "When I say go, run as fast as you can until you reach the finish line. 1, 2, 3, GO!" Timing begins with the word GO and ends when the child's second foot crosses the finish line.
Scoring:	Record the time it takes the child to run 10 meters.

10-Meter Run Test Reference Data

Age (years)	Mean Score ± SD (sec)
2	7.95 ± 1.48
3	6.89 ± 1.1
4	6.18 ± 1.2
5	5.38 ± 0.92
6	4.99 ± 0.64
7	4.86 ± 0.61
8	4.88 ± 0.65
9	4.78 ± 0.7
10	4.72 ± 0.67
11	4.63 ± 0.81
12	4.89 ±0.71

(Pereira, et al, 2016)

30' Shuttle Run

Purpose:	Used to assess running speed, agility, coordination
Equipment:	Stopwatch, tape measure, tape, 2 cones, 2 blocks/beanbags
Set-Up:	Mark off 30' with 2 pieces of tape and cones (starting line and end line). Place 2 blocks/beanbags just behind the end line.
Directions:	The child begins in standing with toes just behind the starting line, facing the blocks . "When I say go, run, pick up a block, run back and put the block behind the starting line. Run, pick up the second block, run back, and put it behind the starting line." Timing begins with the word GO and ends when the second block is placed behind the line.
Scoring:	Record the time time it takes for the child to run down and back 30' two times.

5 Times Sit to Stand

Purpose:	Used to assess lower limb functional strength
Equipment:	Stopwatch, adjustable height bench
Set-Up:	Adjust bench so child is seated with hip flexed to 90° with feet flat on the floor
Directions:	Child begins seated on bench with half of thighs on the seat, hips flexed to 90° and feet flat on the floor. "Fold your arms across your chest. Stand up and sit down as quickly as possible for 5 times. Continue until I ask you to stop. Ready, go!" Begin timing with trunk flexion and ends when buttocks touches the seat on the 5th repetition.
Scoring:	Record the time it takes the child to perform 5 full repetitions of sit to stand. Calculate the rate (rep/sec) by dividing 5 by the recorded time.

5 Times Sit to Stand Video

5 Times Sit to Stand Data

Diagnosis	Reps/Second
Typical Development	0.57±0.09
CP GMFCS Level I	0.55±0.14
CP GMFCS Level II	0.38±0.16
CP GMFCS Level III	0.19±0.12

Note: This is NOT reference data but does provide insight into differences in performance on the 5 Times Sit to Stand by children with varying motor ability levels

(Wang, et al, 2011)

Reliability, Validity, & Responsiveness

Spastic Diplegia Cerebral Palsy:

- Intrasession reliability – good (ICC = 0.95)
- Test-retest reliability – good (ICC = 0.99)
- Convergent validity – strong correlations with: isometric LE strength ($r \geq 0.43$) except for hip adductors (r=0.30); GMFM-D (r=0.65), GMFM-E (r=0.75), walking speed (r=0.41), and physiological cost index (r=-0.40)
- Minimal detectable difference – average of 3 trials = 0.06 rep/sec, only 1 trial = 0.11 rep/sec

(Wang & Liao, 2011)

Clinical Utility

- The 5 Times Sit to Stand Test may provide an estimate of functional lower extremity strength for children with spastic diplegia who can ambulate independently or with an assistive device
- Valuable to assess muscle weakness and change in response to intervention
- 1 trial is adequate for use in clinical settings

Pediatric Balance Scale (PBS)

Purpose:	Used to assess static and dynamic balance of children in functional contexts
Equipment:	Adjustable height bench, chair with back support & arm rests, stopwatch, tape, 6" high step stool, chalkboard eraser, yardstick/ruler
Set-Up:	Refer to PBS protocol https://www.sralab.org/rehabilitation-measures/pediatric-balance-scale
Directions:	Refer to PBS protocol
Scoring:	Each of the 14 items is rated on a 0-4 point scale. Total possible score of 56 points.

PEDIATRIC BALANCE SCALE

Name: _____ Date: _____

Location: _____ Examiner: _____

Item Description	Score: 0 - 4	Seconds optional
1. Sitting to standing		
2. Standing to sitting		
3. Transfers		
4. Standing unsupported		
5. Sitting unsupported		
6. Standing with eyes closed		
7. Standing with feet together		
8. Standing with one foot in front		
9. Standing on one foot		
10. Turning 360 degrees		
11. Turning to look behind		
12. Retrieving object from floor		
13. Placing alternate foot on stool		
14. Reaching forward with outstretched arm		
Total Test Score		

General Instructions

1. Demonstrate each task and give instructions as written. A child may receive a practice trial on each item. If the child is unable to complete the task based on their ability to understand the directions, a second practice trial may be given. Verbal and visual directions may be clarified through the use of physical prompts.

2. Each item should be scored utilizing the 0 to 4 scale. Multiple trials are allowed on many of the items. The child's performance should be scored based upon the lowest criteria, which describes the child's best performance. If on the first trial a child receives the maximal score of 4, additional trials need not be administered. Several items require the child to maintain a given position for a specific time. Progressively, more points are deducted if the time or distance requirements are not met, if the subject's performance warrants supervision; or if the subject touches an external support or receives assistance from the examiner. Subjects should understand that they must maintain their balance while attempting the tasks. The choice, of which leg stand on or how far to reach, is left to the subject. Poor judgement will adversely influence the performance and the scoring. In addition to scoring items 4, 5, 6, 7, 8, 9, 10, and 13, the examiner may choose to record the exact time in seconds.

PBS Reference Data

Age Range (years)	Mean Score ± SD
2.0-2.5	26.2±6.38
2.6-2.11	34.3±7.72
3.0.3.5	46.0±6.55
3.6-3.11	48.5±5.02
4.0-4.5	49.5±5.76
4.6-4.11	51.2±5.07
5.0-5.5	54.0±2.52
5.6-5.11	53.3±3.20
6.0-6.5	53.8±2.49
6.6-6.11	54.4±1.89
7.0-13.7	55.2±1.74

(Franjoine, et al. 2010)

Reliability

Typical Development

- Test-retest reliability – high (ICC = 0.923)
- Interrater reliability – high (ICC = 0.972)
- Intrarater reliability – high (ICC – 0.895-0.998)

Mild-Moderate Motor Impairments

- Test-retest reliability – high (ICC = 0.998)
- Interrater reliability – high (ICC = 0.997)

(Franjoine et al, 2003)

Validity

Cerebral Palsy

- Concurrent validity – excellent (r=0.92-0.95) between PBS and GMFM-66
- Predictive validity – excellent (r=0.90-0.92) between PBS and GMFM-66
- Discriminant validity – significant difference ($p<0.05$) between PBS scores across GMFCS levels

(Chen, et al. 2013)

Responsiveness

Typical Development

- Ceiling effect noted for children 7 years old and older (69.1% achieved the maximal score of 56 points)

Cerebral Palsy

- Minimal detectable change (MDC) – 1.59 points for PBS total
- Minimally clinically important difference (MCID) – 5.83 points for PBS total

Pediatric Clinical Test of Sensory Interaction for Balance (P-CTSIB)

Purpose:	Used to assess the maturity of the vestibular, somatosensory, and visual systems and their contribution to balance
Equipment:	Stopwatch, foam pad, conflict dome
Set-Up:	Ask the child to remove shoes. Have all equipment readily available in environment with limited distractions.
Directions:	Have the child stand erect with hands on hips, without moving, looking straight ahead (when eyes are open) for duration of trial (up to 30 seconds) for each condition. Complete 2 trials of each condition.
Scoring	The best of the two trials is included in total sum of scores.

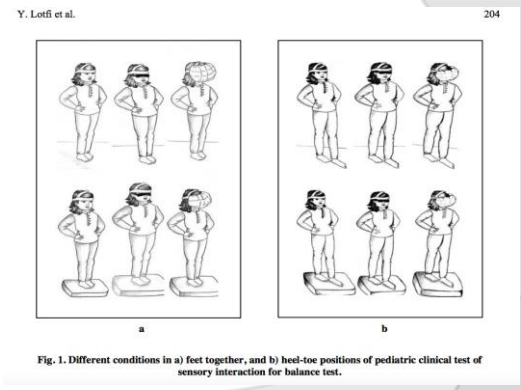


Fig. 1. Different conditions in a) feet together, and b) heel-toe positions of pediatric clinical test of sensory interaction for balance test.

(Lotfi et al, 2017)

P-CTSIB Reference Data

Table 1
Subjects' Standing Balance Duration on the P-CTSIB[a]

Age[b]	Duration (in sec)			
	M	Median	*SD*	Low/5th percentile/High
	Feet-Together Position			
Condition 5				
4-yr-olds	24	30	9	5/14/30
5-yr-olds	27	30	7	8/30/30
Condition 6				
4-yr-olds	27	30	6	14/22/30
5-yr-olds	29	30	4	11/30/30
	Heel-Toe Position			
Condition 1				
4-yr-olds	18	23	11	0/7/30
5-yr-olds	25	30	10	1/22/30
Condition 2				
4-yr-olds	6	5	7	0/1/30
5-yr-olds	12	10	9	1/3/30
Condition 3				
4-yr-olds	5	4	6	0/0/19
5-yr-olds	11	9	10	0/2/30
Condition 4				
4-yr-olds	12	11	10	0/2/30
5-yr-olds	21	25	10	0/13/30
Condition 5				
4-yr-olds	4	3	5	2/4/15
5-yr-olds	6	7	6	0/5/27
Condition 6				
4-yr-olds	1	0	2	0/0/6
5-yr-olds	4	2	7	0/1/24

Note. Condition 1: Normal support surface, normal vision. Condition 2: Normal support surface, vision eliminated. Condition 3: Normal support surface, altered vision. Condition 4: Altered support surface, normal vision. Condition 5: Altered support surface, vision eliminated. Condition 6: Altered support surface, altered vision.
[a]P-CTSIB = Pediatric Clinical Test of Sensory Interaction for Balance. [b]*n* = 20 subjects for each group.

(Richardson, et al. 1992)

Reliability & Clinical Utility

Typical Development

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with

Functional Reach Test (FRT)

Purpose:	Used to assess dynamic standing balance
Equipment:	Tape measure/measuring stick, level, tape, pen
Set-Up:	Place a piece of tape on the floor to mark the starting position. Measuring stick or tape measure taped to wall at height of child's acromion with child's arm flexed to 90°.
Directions:	Child stands with toes on starting line. "Make a fist, raise your arms to shoulder height, Reach forward as far as you can, but don't fall or take a step." Repeat up to three trials.
Scoring:	Record the distance reached to the nearest 0.5 cm.

Functional Reach Test Video

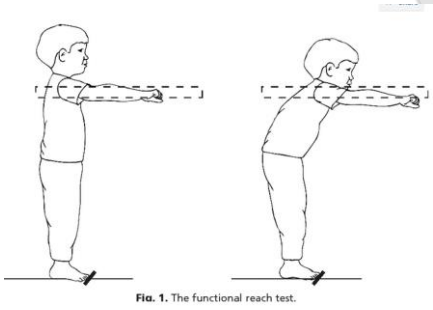

Fig. 1. The functional reach test.

Fig. 1. The functional reach test.

FRT Reference Data

Age (years)	Mean Reach (cm)	Critical Reach (cm)
5-6	21.17	16.79
7-8	24.21	20.57
9-10	27.97	25.56
11-12	32.79	29.68
13-15	32.30	29.58

FRT Reference Data

Age (years)	Mean ± SD (cm)
3	11.4 ± 2.6
4	13.6 ± 3.0
5	15.7 ± 4.4

(Norris, et al, 2008)

Reliability & Clinical Utility

Typical Development

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-
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ACTIVITY

Timed Up and Go (TUG)

Purpose:	Measure the time it takes for a child to stand up from a bench/chair, walk a short distance, and turn to the bench/chair.
Equipment:	Stopwatch, armless chair/bench, tape measure, tape
Set-Up:	Mark floor with 2 lines (using tape) 9' 10" apart. Place chair/bench behind one line so that child's shoes are touching line when seated. Child sits in chair with knees and hips flexed to 90°.
Directions:	nd, the
Scoring:	Timing begins on the word GO and end when the child sits back down. Repeat up to 3 trials. Record times.

TUG Reference Data

Age	Male (mean ± SD)	Female (mean ± SD)
5	6.98 ±1.11	7.17 ±1.12
6	6.75 ±1.23	6.82 ±1.11
7	6.75 ±1.14	6.79 ±1.17
8	6.09 ±1.14	6.59 ±1.15
9	5.85 ±0.88	6.41 ±1.01
10	6.09 ±0.98	6.34 ±0.94
11	6.24 ±0.97	6.69 ±0.79
12	6.73 ±1.09	6.78 ±0.83
13	7.24 ±0.97	7.09 ±1.08

(Rzkowitz, et al, 2016)

TUG Data

GMFCS Level	Mean TUG Time (SD), sec
GMFCS I	8.35 (2.92)
GMFCS II	15.42 (7.39)
GMFCS III	52.82 (43.16)

Note: TUG scores reported to determine reliability and responsiveness should not be interpreted as reference data

(Carey, et al, 2016)

Reliability & Responsiveness

- Cerebral palsy – reliable and responsive in children with CP between the age of 3-10 yrs old in GMFCS levels I-III; MCID estimates range from 0.22-5.31 seconds
- Down syndrome – high intra- (ICC = 0.93 - 0.95) and intersession reliable (ICC = 0.95) in children with DS, average age of 10 yrs, 6 mos
- Typically developing school-age – useful in school settings to measure functional mobility in the classroom
- Typically developing preschool-age - modified TUG is sensitive to age-related changes in 3-5 yr olds

Timed Floor to Stand – Natural (TFTS-N)

Purpose:	Used to assess natural paced transitions that reflect typical school behaviors.
Equipment:	Stopwatch, tape measure, tape
Set-Up	Mark floor with 2 lines (using tape) 9'10" apart.
Directions:	Child begins seated in cross-legged position with front-most part of body touching one line. "When I say go, stand up, walk to the line, turn around, walk back to the starting line, and sit back down with your legs crossed. Walk, don't run. 1, 2, 3 GO!"
Scoring:	Record the time it takes for the child to stand up, walk to the line, turn around, walk back to the starting line and sit down.

TFTS-N Data

Age (years)	Mean (seconds) (SD)
8	8.45 (0.68)
9	7.47 (0.50)
10	6.34 (0.43)
11	6.27 (0.30)
12	7.69 (1.04)

Note: The ranges of times established for reliability testing should NOT be misinterpreted as reference data.

(Wiegand & Kaplan, 2015)

Reliability, Validity & Clinical Utility

Typically Developing

- Intratester reliability – good to excellent (ICC=0.713 – 0.800)
- Intertester reliability – excellent agreement among raters (ICC=0.988)
- Test-retest reliability – good reliability between trials (ICC=0.871)
- Face validity – assess frequently occurring task in school settings
- Useful to establish baseline function and IEP goals for school-age children

(Weingarten & Kaplan, 2015)

Timed Up and Down Stairs (TUDS)

Purpose:	Outcome measure designed to reflect changes in musculoskeletal and neuromuscular systems that contribute to the control of posture.
Equipment:	Staircase, stopwatch, tape measure, tape
Set-Up:	Mark floor 12" from bottom step. The child begins standing on the taped line.
Directions:	"Quickly, but safely go up the stairs, turn around on the top step (landing) and come all the way down until both feet land on the bottom step (landing)." Recommended that the child perform the TUDS without orthotics, if possible.
Scoring:	Record the time it takes the child to walk up and down the flight of stairs.

Timed Up & Down Stairs Video

TUDS Data

Typically Developing

Age (years)	Mean Time (sec) ± SEM
8-10	8.8 ± 0.4
11-12	7.6 ± 0.6
13-14	7.3 ± 0.3

Note: The data gathered for reliability and testing should NOT be misinterpreted as reference data

Cerebral Palsy

GMFCS Level	Mean Time (sec) ± SEM
I	15.5 ± 2.40
II/III	24.5 ± 3.83

Validity, Reliability, & Clinical Utility

Cerebral Palsy

- Concurrent validity – moderate to good relationships (r=0.78, -0.57, -0.77) reported between the TUDS, TUG, functional reach test, and timed one legged stance

Typical Development & Cerebral Palsy Combined

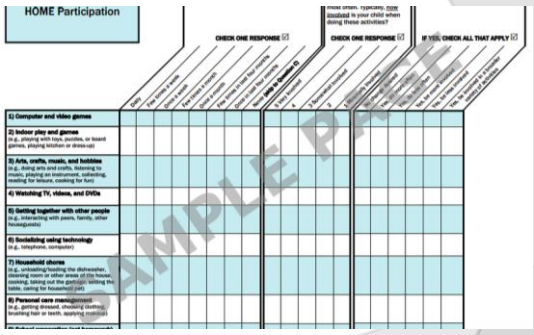
- Test-retest reliability – excellent (ICC=0.94)
- TUDS can be used to assess functional mobility and possibly documenting change in TD children as well as those with CP

(Zaino, et al, 2004)

PARTICIPATION

Participation & Enjoyment Measure – Children & Youth (PEM-CY)

- Measure that evaluates participation in the home, at school, and community
- Takes into consideration environmental factors in each setting
- Provides parents/caregivers with information regarding child's current level of participation and encourages problem solving that leads to positive change
- Available for purchase: https://www.canchild.ca/en/shop/2-pem-cy-participation-and-environment-measure-children-and-youth



https://www.canchild.ca/en/shop/2-pem-cy-participation-and-environment-measure-children-and-youth

PROMIS Measures

- Person-centered assessments used to measure global, physical, mental, and social health for typically developing children and those living with a disability or chronic health condition
- Self-report – ages 8-17 years old
- Parent/Proxy-report – ages 5-17 years old
- Available online for free: http://www.healthmeasures.net/explore-measurement-systems/promis

PROMIS Measures

- Mobility
- Physical Activity
- Pain Behavior
- Sleep Disturbance
- Strength Impact
- Upper Extremity

http://www.healthmeasures.net/explore-measurement-systems/promis

INTERPRETATION

Interpretation of Scores

- Compare to baseline score
  - Raw change, percent improvement
- Compare change scores to available MDC or MCID
- Compare to available normative data

How Often Should I Re-test?

- What data to you hope to gain from re-testing?
  - Assess progress, evaluate treatment strategies, update goals
- Child-specific factors
  - Age, diagnosis, change in status from surgery/injury/progressive disability, potential for change
- Resources
  - Necessary equipment in specific settings, available evidence supporting use of specific measures

CASE EXAMPLES

Case Example A

- A school PT is evaluating a 8 year old boy who has a diagnosis of spastic diplegia cerebral palsy. He is able to walk independently but does fall when trying to walk quickly or negotiate obstacles. He wants to improve his ability to keep up with his peers at school and to decrease his falls.
- Which functional outcome measures would you suggest for use and why?

Case Example A

- 30sWT : assess walking speed and compare to TD peers
- 6-MWT: assess cardiovascular endurance and compare to TD peers
- PBS: assess functional balance; reliable in children with mild – moderate motor impairment
- 5xSST: assess LE strength; reliable and valid for use in children with CP
- TUG: assess time to complete activity commonly performed in school setting and compare to TD peers

Case Example B

- 10 year old female with Down syndrome
- Review outcome measures data and interpretation
- Could reported outcome measure data provide justification for continued physical therapy services?

Case Example B

Outcome Measure	Baseline Score	3-Month Score	6-Month Score	Interpretation
5x Sit to Stand	15 sec	13 sec	15 sec	No change
6-MWT	376.24 m	365.43 m	401.67 m	6% improvement; decreased distance compared to TD peers (497.15 ± 66.81)
TUG	9.27 sec	8.84 sec	7.59 sec	18% improvement; slow compared to TD peers (6.34 ± 0.94)
TUDS	13.4 sec	15.7 sec	12.2 sec	9% improvement

Additional Resources

- APTA Academy of Pediatric Physical Therapy – List of Pediatric Assessment Tools Fact Sheet:https://pediatricapta.org/includes/fact-sheets/pdfs/13%20Assessment&screening%20tools.pdf
- Rehabilitation Measures Databasehttps://www.sralab.org/rehabilitation-measures

Questions??

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