



The Home Health Section Toolbox of Standardized Tests & Measures



HOME HEALTH SECTION
AMERICAN PHYSICAL THERAPY ASSOCIATION

Developed by the Practice Committee
of the Home Health Section
of the American Physical Therapy Association

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The Home Health Section Toolbox of Standardized Tests & Measures

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The Home Health Section is a specialty component of the American Physical Therapy Association (APTA), www.apta.org

Overview of the Toolbox

Toolbox Task Force History

- ☑ Initiated in 2011
- ☑ Toolbox task force was charged to perform multiple literature review as per sub groups based on impairment categories.
- ☑ Searching the literature for objective test measures (measures in practice and those newly identified and appropriate to home care).
- ☑ Objective tests were reviewed for validity, reliability, norms, sensitivity, and specificity.
- ☑ Tests chosen for inclusion in the toolbox recommendations were selected based on the statistical design and strength of the studies.

Toolbox Development Process

- ☑ Currently utilized in home care
- ☑ Guide to PT Practice's to organize impairment categories
- ☑ Peer-Review Selection Process
 - Feasibility in the home setting (equipment, time, space)
 - Literature search/review by task force ("expert")
- ☑ Ranked available research articles according to:
 - Strength of the study
 - Sample size, study design, currency of research article
 - Applicability to the home care setting

How was the HOME HEALTH SECTION Toolbox created?

1. Asked Question. What tools are available based on the impairment categories in the Guide for PT practice?
2. Performed individual and group literature reviews. Group was divided into sub groups by impairment categories.
3. Tools were recommended for inclusion based on:
 - a. Critical Appraisal of evidence with ranking the data by follow level of evidence criteria/methodology and statistical analysis.
 - b. Ease of use in the Home Care Setting (feasibility, cost, copyright-free, equipment, and time).

How did we grade the evidence?

1. Evidence-Based Practice: A Primer
2. Levels of Evidence and Grades of Recommendations: An Evaluation of Literature by James G. Wright, MD, MPH, FRCSC
3. PT Bulletin Online Article: All Evidence is Not Created Equal
4. All Evidence is Not Created Equal: A Discussion of Levels of Evidence by Steven Glaros

What the toolbox is NOT!

- ☑ The toolbox is not an all-inclusive list of objective tests.
- ☑ The toolbox is not an endorsement of the tools listed. But, rather a listing of suggested tools used by the industry experts for their psychometric properties.
- ☑ There are many tools not listed that ARE valid and reliable for use in home health.

What the HOME HEALTH SECTION Toolbox Includes

- ☑ Specific to each “tool” in the “kit”
 - Statistical data/psychometric properties of the instrument
 - Reliability, validity
 - Additional: sensitivity, specificity, minimally detectable change/clinically significant difference
 - Correlations with other instruments
 - Population specifics
 - Score interpretation
 - Descriptive categories, cut-off scores
 - Protocols for administration
 - Equipment
 - Time for completion

Impairment Categories / Toolbox Instruments

Table of Contents

The Toolbox Task Force used APTA’s *Guide to Physical Therapist Practice* to assist in creating impairment groups in order to arrange objective tests in groups to assist with test selection and foster clinical decision making.

The impairment categories are:

- Aerobic Capacity/Endurance
- Arousal/Attention/Cognition
- Balance/Balance Confidence
- Gait/Locomotion
- Mobility/ADL/IADL
- Strength

The tests within each category are:

<input checked="" type="checkbox"/> Aerobic Capacity/Endurance	6
• 2-Minute Step Test (2MST)	7
• Borg Rating of Perceived Exertion (Borg RPE)	8
<input checked="" type="checkbox"/> Arousal/Attention/Cognition.....	9
• Montreal Cognitive Assessment (MOCA)	10
• St. Louis University Mental Status Exam (SLUMS)	11
• Trail Making Test (TMT) A, B	12
• Geriatric Depression Scale (GDS)	13
• Cornell Scale for Depression in Dementia (CSDD)	14
<input checked="" type="checkbox"/> Balance/Balance Confidence	15
• Berg Balance Test (BBT)	16
• Tinetti-POMA	17
• Modified Falls Efficacy Scale (mFES)	18
• Activities-Specific Balance Confidence (ABC).....	19
<input checked="" type="checkbox"/> Gait/Locomotion	20
• Functional Gait Assessment (FGA)	21
• Dynamic Gait Index (DGI).....	22
• Gait Speed (GS)	23
<input checked="" type="checkbox"/> Mobility/ADL/IADL	24
• Timed Up & Go (TUG)	25
• Barthel Index	28
<input checked="" type="checkbox"/> Strength	29
• Arm Curl Test	30
• 30-Second Chair Stand Test (30CST)	31

Aerobic Capacity / Endurance

Resources/Links to the protocols:

- Two Minute Step Test –
http://www.homehealthsection.org/associations/9809/files/Measure_Up_Article_II.pdf
<http://web.missouri.edu/~proste/tool/cv/2min-step-rikli-jones.rtf>
- Borg Scale Rate of Perceived Exertion –
<http://www.cdc.gov/physicalactivity/everyone/measuring/exertion.html>
<http://www.webmd.com/lung/copd/borg-scale-of-perceived-exertion-with-exercise>

Instrument Name:

2MST

- Specific population(s):
 - Community-dwelling older adults
- Age/gender norms:
 - 5-yr increments from 60-94 years of age
 - Male/female norms
- Descriptive categories/cut-off scores:
 - Average range of steps
 - Below & above average designations
- Psychometric Properties:
 - Reliability = .90
 - Criterion Validity = .73 - .74 with 1-mi. walk, treadmill
Moderate correlation
- Protocol for standardized administration
 - Equipment: stop watch; tally counter; tape measure or 30inch string; masking tape
 - Time: approx. 5 minutes

2-Minute Step Test – Score Table

Age	Men	Women
60-64	87-115	75-107
65-69	86-116	73-107
70-74	80-110	68-101
75-79	73-109	68-100
80-84	71-103	60-91
85-89	59-91	55-85
90-94	52-86	44-72

Instrument Name:

Borg RPE

- Specific population(s):
 - None defined
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - Perception of exertion depends mainly on the strain and fatigue in muscles and on feeling of breathlessness or aches in the chest
 - 6-20 scale (original)
 - 11-14 = mid-range
 - 1-10 scale (modified)
 - 3-6 = mid-range

Borg Rating of Perceived Exertion Scales			
Original RPE Scale		Modified RPE Scale	
Rating	Perception of Effort	Rating	Perception of Effort
6	No exertion at all	0	Nothing at all
7	Extremely light	0.5	Very, very weak (just noticeable)
8		1	Very weak
9	Very light		
10		2	Weak
11	Light		
12		3	Moderate
13	Somewhat hard	4	Somewhat strong
14			
15	Hard (heavy)	5	Strong (heavy)
16		6	
17	Very hard	7	Very strong
18		8	
19	Extremely hard	9	
20	Maximal exertion	10	Very, very strong (almost maximal)

Arousal / Attention / Cognition

Links/Resources to the protocols:

- ☑ Montreal Cognitive Assessment (MOCA)
<http://www.mocatest.org>
- ☑ St Louis University Mental State Exam (SLUMS)
<http://aging.slu.edu/index.php?page=saint-louis-university-mental-status-slums-exam>
- ☑ Trailmaking Test (A and B)
 - http://doa.alaska.gov/dmv/akol/pdfs/uiowa_trailmaking.pdf
- ☑ Geriatric Depression Scale (GDS-15)
 - <http://www.stanford.edu/~yesavage/GDS.english.short.score.html>
- ☑ Cornell Scale for Depression in Dementia
 - <http://www.scalesandmeasures.net/files/files/The%20Cornell%20Scale%20for%20Depression%20in%20Dementia.pdf>

Instrument Name:

MOCA

- Specific population(s):
 - Community-dwelling older adults
 - Parkinson's Disease
 - TIA/CVA
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - Normal = > 26/30
 - Mild Cognitive Impairment (MCI) = < 26/30
 - Range: 19-25 (avg: 22)
 - Alzheimer's Disease = < 26/30
 - Range: 11-21 (avg: 16)
- Psychometric Properties:
 - Sensitivity:
 - MCI = 90%
 - AD = 100%
 - Specificity: 87%
- Protocol for standardized administration
 - Equipment: instructional guide; score form; pencil/pen; stopwatch
 - Time: 15-30 minutes

Instrument Name:

SLUMS

- Specific population(s):
 - Community-dwelling older adults
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - Normal:
 - > HS Education: > 27/30
 - < HS Education: > 25/30
 - Mild Neurocognitive Disorder (MNCD):
 - > HS Education: 21-26/30
 - < HS Education: 20-24/30
 - Dementia:
 - > HS Education: 1-20/30
 - < HS Education: 1-19/30
- Psychometric Properties:
 - Sensitivity and Specificity
 - *category dependent
 - 95% Confidence Intervals
 - *category dependent
- Protocol for standardized administration
 - Equipment: instructional guide; form; pencil/pen
 - Time: 7 minutes

Instrument Name: TMT (A, B)

- Specific population(s):
 - Community-dwelling adults (age range 18-89 years)
- Age/gender norms:
 - Age (11 categories) and education (2 categories) variances
- Descriptive categories/cut-off scores:
 - Increasing age + decreasing education resulted in ↓ scores
 - Not equivalent on Trail A and B
 - Higher scores = greater impairment
 - Trail A: avg = 29 secs.
 - abnormal = > 78 secs.
 - Trail B: avg = 75 secs.
 - abnormal = >273 secs.
- Psychometric Properties:
 - Not described in research literature reviewed
 - Commonly used in research published in peer-review journals
- Protocol for standardized administration
 - Equipment: instructional guide; score form; pencil/pen
 - Time:
 - Trail A ~ 90 seconds
 - Trail B ~ 3 minutes

Instrument Name:

GDS-15

- Specific population(s):
 - Elderly persons with/without mild-moderate dementia and/or physical illness
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - 1-4 Score = No cause for concern
 - 5-9 Score = Strong probability of depression
 - 10+ Score = Indicative of depression
- Psychometric Properties:
 - Sensitivity (at 4/5 cut-off): 92.7%
 - Specificity (at 4/5 cut-off): 65.2%
- Protocol for standardized administration
 - Equipment: scoring guide; form; pencil/pen
 - Time: 5 minutes

Instrument Name: CSDD

- Specific population(s):
 - Elderly persons with suspected depression; with/without dementia
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - Final ratings represent the rater's clinical impression rather than informant responses.
 - Scale Range of Scores from 0-2 (19 items)
 - Scores > 10 = probable major depression
 - Scores > 18 = definite major depression
- Psychometric Properties:
 - Correlative status with GDS
 - Convergent Validity: High
 - Sensitivity: 93% (at > 6)
 - Specificity: 97% (at > 6)
- Protocol for standardized administration
 - Equipment: scoring guide; score form; pencil/pen
 - Time: 20 minutes

Balance / Balance Confidence

Resources/Links to the protocols:

- Balance
 - Berg Balance Test
 - <http://www.fallpreventiontaskforce.org/pdf/BergBalanceScale.pdf>
 - Tinetti POMA
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=1039>
- Balance Confidence
 - Modified Falls Efficacy Scales (mFES)
 - <http://web.missouri.edu/~proste/tool/vest/Modified-Falls-Efficacy-Scale.pdf>
 - Activities Specific Balance Confidence Scale (ABC)
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=949>

Instrument Name:

BBT

- Specific population(s):
 - Community-dwelling older adults (> 65 yrs and older)
 - Parkinsonism
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - < 45/56 = impaired balance; (+) falls risk
 - > 45/56 = impaired balance; (-) falls risk
 - Sensitivity ↑'s with cut-off score >48/56
 - **PTJ exception
- Psychometric Properties:
 - Reliability = (ICC) > .90
 - Sensitivity: 91%
 - Specificity: 82%
 - Clinically significant difference/minimally detectable change: 6, 8 pts
- Protocol for standardized administration
 - Equipment: score sheet, stopwatch, shoe, ruler, stepstool
 - Time: 20 minutes

Instrument Name:

Tinetti-POMA

- Specific population(s):
 - Community-dwelling older adults
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - 25-28 = low falls risk
 - 19-24 = medium falls risk
 - < 19 = high falls risk
- Psychometric Properties:
 - Reliability = (ICC) 0.93
 - Sensitivity:
 - Gait (8/12 cut-off) = 21%
 - Balance (12/16 cut-off) = 24%
 - Specificity:
 - Gait (8/12 cut-off) = 95%
 - Balance (12/16 cut-off) = 91%
 - Clinically significant difference/minimally detectable change: 5 points (PTJ)
- Protocol for standardized administration
 - Equipment: hard, armless chair; stopwatch, 15ft walkway
 - Time: 20 minutes

Instrument Name:

mFES

- Specific population(s):
 - Older adults (age ranges 66-89 yrs of age)
 - With/without cognitive impairments
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - > 80% = balance confidence WFL; no probable fear of falling
 - < 80%: impaired balance confidence; (+) fear of falling
- Psychometric Properties:
 - Reliability = (test-retest) 0.71
 - Correlation with ABC = 0.84
- Protocol for standardized administration
 - Equipment: score/instruction form; pencil/pen
 - Time: 10 minutes

Instrument Name: ABC

- Specific population(s):
 - Older adults (ranging from 65-95 yrs of age)
 - > 1 yr post-stroke
 - Parkinsonism; PD
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - > 80% = balance confidence WFL; no probable fear of falling
 - < 80%: impaired balance confidence; (+) fear of falling
- Psychometric Properties:
 - Reliability = (ICC) 0.92
 - Correlation with FES = 0.84
- Protocol for standardized administration
 - Equipment: instruction sheet; score sheet; pencil/pen
 - Time: 10 minutes

Gait / Locomotion

Resources/Links to the protocols:

Gait

- Functional Gait Analysis (FGA)
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=893>
- Dynamic Gait Index (DGI)
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=898>
- Gait Speed
 - http://www.mobile-pt.com/files/measure_up-gait_speed.pdf

Instrument Name:

FGA

- Specific population(s):
 - Adults/Older adults (ranging from 45-90 yrs of age)
 - Parkinson's Disease
 - Post-stroke
 - Vestibulopathy
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - < 22/30 predictive of falls
- Psychometric Properties:
 - Reliability = (ICC) 0.93; (test-retest) 0.91
 - Sensitivity: 72%
 - Specificity: 78%
 - Vestibulopathy = (ICC) 0.86; (test-retest) 0.74
- Protocol for standardized administration
 - Equipment: score sheet; stopwatch; shoe box; steps; pencil/pen
 - Time: 5 minutes
 - Space: approximately 20 feet

Instrument Name:

DGI

- Specific population(s):
 - Adults/Older adults (ranging from 21-77 yrs of age)
 - Parkinson's Disease; MS
 - > 3 mos post-stroke
 - Vestibulopathy
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - < 19/24 = (+) falls risk in community-dwelling older adult
 - < 12/24 = (+) falls risk in MS
- Psychometric Properties:
 - Reliability = (ICC) 0.96
 - Correlation with TUG = 0.80
 - Validity (construct/concurrent) = 0.68 – 0.83
 - MDC/CSD: 2.9 pts
- Protocol for standardized administration
 - Equipment: score sheet; 2 obstacles (same size); stairs; 20ft path; pencil/pen
 - Time: 6-30 minutes

Instrument Name:

GS

Gait Velocity Distance	Score Categories/Cut-off	Feet/Meter Conversion
10 Feet	<1.97ft/sec = predictive of hospitalization risk < 1.86ft/sec = (+) falls risk	_____
4 Meter	0.0-0.4m/sec = household amb. 0.4-0.6m/sec = limited community amb ≤ 0.57m/sec = (+) falls risk 0.6 – 1.0m/sec = lmtd – safe community amb > 1.0m/sec = functional community amb > 1.2m/sec = safe to cross streets	13 feet 1.48 inches

NOTE: There are additional distances that can be utilized for testing – establish internal consistency in your agency.

NOTE: The shortest distance found reliable/valid in the research literature is 8 feet. Distances greater than 20 feet become difficult to establish in the home setting.



Mobility / ADL / IADL

Resources/Links to the protocols:

- Mobility
 - Timed Up and Go
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=903>
- ADL/IADL
 - Barthel Index
 - <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=916>

Instrument Name:

TUG

- Specific population(s):
 - Community-dwelling older adults
 - Vestibulopathy
 - Parkinson's Disease
 - Post-hip fracture
 - Alzheimer's Disease
- Age/gender norms: see next slide
- Descriptive categories/cut-off scores:
 - Mobility impairment categories (ref next slide)
 - 14 seconds = (+) falls risk
- Psychometric Properties:
 - Reliability = 0.98 – 0.99
 - Sensitivity: 0.80
 - Specificity: 0.934
 - Correlates mod-high with:
 - Berg, gait velocity, Barthel
- Protocol for standardized administration
 - Equipment: stopwatch; tape measure; standard-height chair with arms
 - Time: 2-5 minutes

TUG Normative Data

	MALES				FEMALES			
	AGE GROUP				AGE GROUP			
	71-75	76-80	81-85	86-99	71-75	76-80	81-85	86-99
N	73	53	29	16	64	35	25	13
Mean	8.6	9.42	10.34	11.13	10.7	10.71	12.36	13.15
S.D.	2.24	2.35	3.65	3.95	2.45	3.77	3.33	3.65
Range	5-18	5-15	5-13	6-21	6-18	5-25	8-20	9-22
Percentile								
95	13.30	14.30	19.50	21.00	15.00	18.60	20.00	22.00
90	11.00	13.60	14.00	18.20	14.00	15.20	17.60	19.60
80	10.00	11.00	13.00	13.80	13.00	13.00	15.00	16.00
70	9.00	10.00	12.00	12.00	12.00	12.00	14.20	15.00
60	9.00	10.00	10.00	11.20	11.00	11.00	12.00	13.80
50	8.00	9.00	9.00	11.00	10.00	10.00	12.00	12.00
40	8.00	8.00	8.00	10.60	10.00	9.40	11.00	12.00
30	7.00	8.00	8.00	8.10	9.00	9.00	10.00	10.40
20	7.00	7.80	8.00	7.40	9.00	8.00	10.00	9.80
10	6.40	7.00	7.00	6.70	7.50	6.60	8.00	9.00
5	5.70	6.00	6.00	6.00	7.00	5.80	8.00	9.00
1	5.00	5.00	5.00	6.00	6.00	5.00	8.00	9.00
* data are seconds								

Pondal M and delSer T. Normative Data and Determinants for the Timed "Up and Go" Test in a Population-Based Sample of Elderly Individuals Without Gait Disturbances. J GeriatrPhysTher. 2008;31(2):57-63.

Timed Up & Go		
Time to Complete Test	Mobility Impairment Category	Falls Risk
< 10 seconds	Independent	NO
10-20 seconds	Mostly Independent	YES, if > 14 seconds
20-30 seconds	Moderately Impaired	YES
> 30 seconds	Severely Impaired; probable ADL dysfunction	YES

Agency should adopt internal consistency in completion of this standardized instrument.

Variations in # of Trials: 1 trial; average of 2 -3 trials

Variations in measurement: 10ft distance measured from either front leg of test chair or front of individual's foot when seated in chair

Variations in turn strategy: pivot turn or walk around a designated marker at 10ft mark

Instrument Name:

Barthel Index

- Specific population(s):
 - Older Adults (ranging from 16-75 yrs of age)
 - Post-stroke, TBI and/or dementia
- Age/gender norms: N/A
- Descriptive categories/cut-off scores:
 - Cutoff scores that indicate a favorable outcome:
 - > 95 (sensitivity 85.6%; specificity 91.7%)
 - > 90 (sensitivity 90.7%; specificity 88.1%)
 - > 75 (sensitivity 95.7%; specificity, 88.5%)
- Psychometric Properties:
 - Reliability = .80-0.89 (good) to 0.93 (excellent)
 - Validity (concurrent) = suggested by close association with clinical data
 - Sensitivity to change is limited due to floor/ceiling effects
- Protocol for standardized administration
 - Equipment: None
 - Time: 10-15 minutes
- Multiple versions of test exist



Strength

Resources/Links to the protocols:

- Arm Curl Test
 - http://www.udel.edu/PT/PT%20Clinical%20Services/journalclub/noajc/05_06/chairrisetest.pdf
 - http://www.patientsafety.va.gov/SafetyTopics/fallstoolkit/resources/educational/Balance_Assessment_Handbook.pdf
- 30 Second Chair Stand Test
 - http://www.homehealthsection.org/associations/9809/files/Measure_Up_Article_1.pdf

**Instrument Name:****Arm Curl Test**

Normative Data for Arm Curl Test							
Women	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90 - 94
Arm Curl Test (# of reps)	13-19	12-18	12-17	11-17	10-16	10-15	8-13
Men	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90 - 94
Arm Curl Test (# of reps)	16-22	15-21	14-21	13-19	13-19	11-17	10-14

Arm Curl Test: Assesses upper-body strength

Equipment: Stopwatch, folding chair without arms, 5-lb.dumbbell for women, 8-lb dumbbell for men.

Scoring: The score is the total number of arm curls completed in 30 seconds. If the arm is more than halfway up at the end of 30 seconds, it counts as a curl.

**Instrument Name:****30CST**

- Specific population(s):
 - Community-dwelling older adults
- Age/gender norms:
 - 5-yr increments from 60-94 years of age
 - Male/female norms
- Descriptive categories/cut-off scores:
 - Average range of completed stands
 - Below & above average designations
- Psychometric Properties:
 - Reliability = (ICC) 0.90; (test-retest) 0.96
 - Correlates to leg press performance for LE strength (0.78 men; 0.71 women)
- Protocol for standardized administration
 - Equipment: test chair; stopwatch; tally counter
 - Time: < 5 minutes

30-Second Chair Stand Test – Score Table

Age	Men	Women
60-64	14-19	12-17
65-69	12-18	11-16
70-74	12-17	10-15
75-79	11-17	10-15
80-84	10-15	9-14
85-89	8-14	8-13
90-94	7-12	4-11



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