

*Evolent	
Clinical guidelines MEASURABLE PROGRESSIVE IMPROVEMENT	Original Date: November 2015
Physical Medicine – Clinical Decision Making	Last Revised Date: December 2023
Guideline Number: Evolent_CG_605	Implementation Date: July 2024

Table of Contents

GENERAL INFORMATION	3
STATEMENT	3
PURPOSE	3
MEASURABLE IMPROVEMENT	3
DEFINED	3
SCOPE	3
[‡] MEASURABLE IMPROVEMENT ACCEPTABLE THRESHOLDS	4
5 Times Sit to Stand Test (5XSTS)	4
6-Minute Walk Test (6MWT) for Older Adults	4
10 Meter Walk Test (10MWT)	5
Activities of Daily Living Scale of the Knee Outcome Survey	6
Activity-Specific Balance Confidence Scale (ABC)	6
Berg Balance Scale (BBS)	6
Bournemouth – Back Questionnaire	7
Bournemouth – Neck Questionnaire	7
Bruininks-Oseretsky Test of Motor Proficiency, 2nd Edition (BOT™-2)	7
Disability of Arm, Shoulder, and Hand (DASH)	8
Disability of Arm, Shoulder, and Hand (QuickDASH)	8
Dizziness Handicap Inventory (DHI)	9
Dynamic Gait Index (DGI)	9
Falls Self Efficacy Scale/Falls Efficacy Scale-International (FES-I)	9
Foot and Ankle Ability Measures (FAAM)	10
Fear Avoidance Belief Questionnaire (FABQ)	10
Functional Gait Assessment (FGA)	10
Functional Rating Index (FRI)	11
Functional Status (FS) measure or FOTO	11
Gait Speed for Adults	11
Global Rating of Change (GRoC)	12
Goal Attainment Scale (GAS)	12
Gross Motor Function Measure-66 (GMFM-66)	12
Headache Disability Inventory (HDI)	13
Keele STarT Back Screening Tool	13
Knee Injury and Osteoarthritis Outcome Score (KOOS)	13
Knee Outcome Survey (KOS)	16
Lower Extremity Functional Scale (LEFS)	16
Lysholm Knee Rating System	18
Neck Disability Index (NDI)	18
Numeric Pain Rating Scale (NPRS)	19

<i>Oswestry Disability Index (ODI)</i>	19
<i>Pain Disability Index</i>	20
<i>Patient Specific Functional Scale (PSFS)</i>	20
<i>Peabody Developmental Motor Scales-2nd Edition (PDMS-2)</i>	21
<i>Pediatric Balance Scale</i>	21
<i>Pediatric Evaluation of Disability Inventory (PEDI)</i>	21
<i>Roland-Morris Disability Questionnaire (RMDQ)</i>	22
<i>Roll Evaluation of Activities of Life (REAL)</i>	22
<i>Shoulder Pain and Disability Index (SPADI)</i>	23
<i>Simple Shoulder Test (SST)</i>	23
<i>Timed Up and Go (TUG)</i>	24
<i>Tinetti Performance Oriented Mobility Assessment (POMA)</i>	25
<i>Upper Extremity Functional Index/Scale (UEFI/UEFS)</i>	25
<i>Visual Analog Scale (VAS) scores</i>	25
<i>Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)</i>	26
BACKGROUND	27
DEFINITIONS.....	28
POLICY HISTORY	30
REFERENCES	31

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

Statement

Outcome measures and pre-determined treatment goals (specific, measurable, and functional) must be used with each patient. These measures must be clearly defined in the patient record to ascertain the amount or degree of change over time and the documentation must provide evidence of lasting, sustainable progress with treatment.

Purpose

This guideline provides minimal clinical thresholds using specific, measurable, and functional treatment goals and/or outcome measures in the determination of improved, lasting, and sustained outcomes. These thresholds will assist in medical necessity reviews of billed clinical services by network practitioners.

All recommendations in this guideline reflect practices that are evidence-based and/or supported by broadly accepted clinical specialty standards.

Measurable Improvement

Defined

Meaningful clinical changes are calculated outcome measures using a standardized assessment tool. Using standardized assessment tools in the management of neuromusculoskeletal disorders follows Physical Medicines professional standards. These include;

- Minimal Clinically Important Change (MCIC)
- Minimal Clinically Important Differences (MCID)
- Minimal Detectable Change (MDC)
- Minimal Important Change (MIC)
- Smallest Detectable Change (SDC)
- Standard Error of Measurement (SEM)
- Small Meaningful Change (SMC)
- Smallest Real Change (SRC)

Scope

In determining meaningful progress toward goals (MCIC and Maximum Therapeutic Benefit (MTB)) the record must include documented relevant standardized outcome assessments. The calculated outcome measures can be used to set goals and determine treatment effectiveness.

Progress towards goals should be assessed at predetermined time periods and supported by anticipated meaningful clinical change based on the treatment plan goals, e.g.;

- Recovery patterns for neuromusculoskeletal conditions involving the low back, neck, and headache disorders show that > 50% of the overall improvement with care occurs within 4 - 6 weeks
- When patients are categorized via predictive modeling, the percentage of those showing significant improvement within 6 weeks rises considerably [1]

This organization requires all practitioner records must evaluate and document whether treatment is resulting in progressive and sustained improvement including; clear, specific, and measurable improvement in the patient's pain and function

- Every two weeks or at regular intervals as appropriate for the documented condition
- Measured by one or more of the below methods for each anatomic region (listed below in ‡Measurable Improvement Acceptable Thresholds) [2]
- If no functional tool is available for the patient's condition it is expected the practitioner will develop specific, measurable, and functional goals

‡Measurable Improvement Acceptable Thresholds

5 Times Sit to Stand Test (5XSTS) [3]

- Older Adults: 5 repetitions of this test exceeding the following can be considered to have worse than average performance
 - 11.4 sec (60 to 69 years)
 - 12.6 sec. (70 to 79 years)
 - 14.8 sec. (80 to 89 years)
- MCID
 - Vestibular Disorders = 2.3 seconds
- MDC
 - Vestibular Disorders = 3.6 to 4.2 seconds

6-Minute Walk Test (6MWT) for Older Adults [4, 2, 5]

- MDC
 - Alzheimer's Disease: 33.5 m (110 feet)
 - Hip OA or knee OA that later received a total joint replacement: 61.34m
 - HD – chronic progressive (premanifest) = 39.22 m
(manifest) = 86.57 m
(early-state) = 56.6 m
(middle-state) = 126.14 m
(late-stage) = 70.65 m
 - MS – chronic progressive: 88 m
 - MS – chronic progressive = 20%

- Older Adults: 58.21 m
- PD: 82 m
- Stroke – chronic: 34 – 37 m or 13% change
- Stroke – Subacute: 61m
- MIC
 - MS – chronic progressive (mild to severe): 21.56 m (patient anchor)
 - MS – chronic progressive (mild to severe): 9.06 m (clinician anchor)
 - MS – chronic progressive (deterioration): -53.35 m (patient anchor)
 - MS – chronic progressive (deterioration): -55.06 m (clinician anchor)
- SEM
 - MS – chronic progressive: 32 m
 - Stroke – subacute: 22 m
 - Stroke – chronic: 12 – 18 m
- SMC
 - Older adults with limited mobility: 20 m (66 feet)
 - Older adults with stroke: 22 m (72 feet)
 - Stroke – subacute: 21 m (anchor stairs)
 - Stroke – subacute: 54 m (anchor-walk block)
- SRC_{individual}
 - MS – chronic progressive (mild to severe): 67.22 m (patient anchor)
 - MS – chronic progressive (mild to severe): 68.32 m (clinician anchor)

NOTE: OA – Osteoarthritis; MS – Multiple Sclerosis; HD – Huntington’s Disease; PD – Parkinson’s Disease

10 Meter Walk Test (10MWT) [6]

- Normative Values (m/s) - Healthy Adults
 - Men/Women (20s) = 1.358/1.341
 - Men/Women (30s) = 1.433/1.337
 - Men/Women (40s) = 1.434/1.390
 - Men/Women (50s) = 1.433/1.313
 - Men/Women (60s) = 1.339/1.241
 - Men/Women (70s) = 1.262/1.132
 - Men/Women (80/90s) = 0.968/0.943
- MDC [7]
 - HD (pre-manifest HD, comfortable) = 0.23 m/s
 - HD (manifest HD, comfortable) = 0.34 m/s
 - HD (early-stage HD, comfortable) = 0.20 m/s
 - HD (middle-stage HD, comfortable) = 0.46 m/s
 - HD (late-stage, comfortable) = 0.29 m/s

- MS = 0.26 m/s
- PD (comfortable) = 0.18 m/s
- PD (fast) = 0.25 m/s
- SCI (incomplete < 12 months) = 0.13 m/s
- Stroke (acute) = 0.11 m/s
- Stroke (chronic > 6 months, comfortable) = 0.18 m/s
- Stroke (chronic > 6 months, fast) = 0.13 m/s
- MCID [7]
 - Stroke (subacute) = 0.16 m/s

Activities of Daily Living Scale of the Knee Outcome Survey [8, 9]

- 10 - 30% reduction in the global score (knee)
- MCID
 - = 7.1%
- MDC
 - = 2.23

Activity-Specific Balance Confidence Scale (ABC) [10, 2, 11, 12]

- MCID
 - Vestibular Disorders = 18.1%
- MDC
 - PD = 11 – 13%
 - PD – Chronic progressive = 13
 - CVA = 14%
- SEM
 - PD – Chronic progressive = 11%
 - PD = 4.01
 - Stroke – acute and chronic = 5.05 – 6.81
 - Older adults = 1.2
- SMC
 - Older adults = 7 points

NOTE: CVA – Cerebral Vascular Accident; PD – Parkinson’s Disease

Berg Balance Scale (BBS) [2, 13, 14, 15, 16]

- MIC
 - MS: deterioration (clinician anchor) = -0.60
 - MS: deterioration (patient anchor) = -1.41
- MCID
 - Subacute stroke (assisted walking): 5 points
 - Subacute stroke (unassisted walking): 4 points
- MDC

- = 6.2 – 6.5 points
- Alzheimer's Disease and Progressive Dementia = 1.92
- HD – chronic progressive premanifest = 1
- HD – chronic progressive manifest = 5
- HD – chronic progressive early-stage = 4
- HD – chronic progressive middle-stage = 5
- HD – chronic progressive late-stage = 5
- Older adults = 8 – 10.5 points
- PD = 5 points
- Stroke (acute) = 6 (90%)
- Stroke (acute) = 7 (95%)
- Stroke (chronic) = 2.7 points
- Stroke (chronic/stable) = 4.66 – 6.7
- SEM
 - Alzheimer's Disease and Progressive Dementia = 0.97
 - Stroke (acute) = 2.49
 - Stroke (chronic/stable) = 1.49 – 2.4
 - TBI = 1.65

NOTE: HD – Huntington’s Disease, MS – Multiple Sclerosis, PD – Parkinson’s Disease, TBI – Traumatic Brain Injury

Bournemouth – Back Questionnaire [17]

- Acute: change of 26 points
- Subacute/chronic: change of 18 points

NOTE: It is recommended that the Bournemouth be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress

Bournemouth – Neck Questionnaire [18]

- A change of 13 points or 36% is considered clinically significant improvement

NOTE: It is recommended that the Bournemouth be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress

Bruininks-Oseretsky Test of Motor Proficiency, 2nd Edition (BOT™-2) [19, 20]

- MCID
 - Children aged 3-6 years with intellectual disability
 - = 6.5 (BOT™-2-SF Standard Scores)
 - Children aged 4-21 years with intellectual disability
 - = 6.5 (aged 4-12 years) (BOT™-2-SF standard scores)
 - = 7.4 (aged 13-21 years) (BOT™-2-SF standard scores)
- MDC
 - Children aged 3-6 years with intellectual disability

- = 7.4 (BOT™-2-SF Standard Scores)
 - Children aged 4-21 years with intellectual disability
 - = 4.2 (aged 4-12 years) (standard scores)
 - = 7.4 (aged 13-21 years) (standard scores)
 - Children aged 7-10 with fetal alcohol syndrome
 - = 6.1 (BOT™-2-SF Raw scores)
- SEM
 - Children aged 3-6 years with intellectual disability
 - = 1.6 (BOT™-2-SF standard scores)
 - Children aged 7 – 9 years with fetal alcohol disorders
 - = 2.2 (BOT™-2-SF raw score) / 2.1 (BOT™-2-SF standard score)

Disability of Arm, Shoulder, and Hand (DASH) [21, 22, 23]

- MCID
 - DASH = 11-15 points
 - Elbow Arthroplasty (much worse or much better) = 19 points
 - Elbow Arthroplasty (somewhat better or somewhat worse) = 10 points
 - Elbow Arthroplasty (no change) = -3 points
 - Musculoskeletal Upper Extremity (Adults) = 10.2
- MDC
 - Humeral Joint Pain and Fractures = 16.1 (DASH)
 - Musculoskeletal Upper Extremity (Adults) = 10.7 – 12.2 (90% CI)
 - Musculoskeletal Upper Extremity (Adults) = 12.75 (95%CI)
 - Shoulder = 10.7% (90%CI)
 - Shoulder = 12.75% (95%CI)
- SEM
 - Humeral Joint Pain and Fractures = 5.82 (DASH)
 - Musculoskeletal Upper Extremity (Adults)= 4.6 – 5.22
 - Osteoarthritis = 2.27 (DASH 0-3*)
 - Osteoarthritis = 3.26 (DASH 0-6*)
 - = 4.49 (DASH 0-12* Osteoarthritis)

NOTE: *Paired differences of the DASH score; DASH 0 is mean score preoperative, DASH 3 is mean score at 3 months, DASH 6 is mean score at 6 months, and DASH 12 is mean score at 12 months.

Disability of Arm, Shoulder, and Hand (QuickDASH) [24]

- MCID
 - Upper Extremity (whole) = 8 points
- MDC
 - = 11 – 17.2 points (90%CI)
 - = 20.4 points (95%CI)
- SEM

- = 6.43 (very much improved)
- = 3.26 (much improved)
- = 3.37 (minimally improved)
- = 10.22 (no change)

Dizziness Handicap Inventory (DHI) [25, 26]

- MCID
 - BPPV = decrease from 18.05 at the first day to 9.54 at 30 days
 - Vestibular Disorders = change of 18 points (95% CI, pretreatment and posttreatment scores difference)
- MDC
 - MS = 22.50
 - Vestibular Disorders = 17.18 points
- SEM
 - Vestibular Disorders = 6.2

NOTE: BPPV – Benign Paroxysmal Positional Vertigo; MS – Multiple Sclerosis

Dynamic Gait Index (DGI) [27, 28, 29, 30, 31]

- MDC
 - MS = 4.19 – 5.54
 - Stroke = 4 points
 - Stroke (change) = 16.6%
 - Stroke (chronic) = 2.6 points
 - PD = 13.3%
 - PD and Older Adults = 2.9 points
 - Vestibular Disorders = 3.2 points
- SEM
 - Older Adults = 1.04 points
 - MS (inter-rater reliability) = 1.51 points
 - MS (intra-rater reliability) = 2.00 points
 - Stroke (chronic) = 0.71
 - Stroke (inter-rater reliability) = 0.94
 - Stroke (test-retest condition) = 0.97
 - Vestibular Disorders = 2.8 points

NOTE: MS – Multiple Sclerosis; PD – Parkinson’s Disease

Falls Self Efficacy Scale/Falls Efficacy Scale-International (FES-I) [32, 33]

- MDC
 - MS = 0.52 points
 - Older Adult (Hip fracture) = 17.7 points
 - Vestibular Disorders = 8.2 points
- SEM

- Older Adult (Hip Fracture) = 6.4 points
- MS = 0.19 points
- Vestibular Disorders = 3.0 points

NOTE: MS – Multiple Sclerosis

Foot and Ankle Ability Measures (FAAM) [34, 35]

- MCID
 - ADL (subscale) = 8% points
 - Sport (subscale) = 9% points
- MDC
 - ADL (subscale 95% CI) = 5.7
 - Sports (subscale 95% CI) = 12.3
- SEM
 - ADL (subscale) = 2.1
 - Sports (subscale) = 4.5

NOTE: ADL – Activities of Daily Living

Fear Avoidance Belief Questionnaire (FABQ) [36, 37, 38]

- MCIC
 - Arthroscopic subacromial decompression (following) = -5.0
- MCID
 - Lower Back Pain = 13 points
 - Physical Activity (Pelvic Girdle pain) = 25%
- MDC
 - Low back pain = -5.4
 - Physical Activity (Pelvic Girdle pain) = 6.1
 - Physical Activity (Subscale) = 12 points
 - Physical Activity (Worker UE injury) = 8 points (change scores equivalent to 30-33% of scale)
 - Work (Subscale) = 9 points
- SEM
 - Physical Activity (Pelvic Girdle pain) = 2.20

Functional Gait Assessment (FGA) [2, 11, 39, 40]

- MCID
 - Older Adults = 4 points (from interim to end of care)
 - Vestibular Disorders = 4 points
 - Vestibular Disorders = 18.1%
- MDC
 - PD = 4 points
 - Stroke (acute and chronic) = 4.2

- Stroke (acute and chronic) = 14.1%
- Vestibular Disorders (acute) = 6 points (95% CI)
- SEM
 - Stroke = 1.52

NOTE: PD – Parkinson’s Disease

Functional Rating Index (FRI) [41]

- MCIC
 - Spinal musculoskeletal system = 10% absolute change
- MCID
 - Spinal musculoskeletal system = 8.4%
- MDC
 - Spinal musculoskeletal system = 15%

NOTES:

- Acute and subacute conditions: recommended the FRI be used at baseline and every 1 week or 3 visits thereafter
- Chronic conditions: recommended the FRI be used at baseline and every 2 weeks or 6 visits thereafter
- If the score does not improve by at least 10% (absolute change) in any two successive two-week periods, you should pursue a change in management

Functional Status (FS) measure or FOTO [42, 43]

- The MCII (Minimally Clinically Important Improvement) and MDC are stated on the assessment report
 - For significant, minimal improvement, the patient status should increase by the MDC value

NOTE: FOTO summary report is available upon request

Gait Speed for Adults [44, 45, 46]

- MCID
 - Joint pain and fractures = 0.1 m/sec
 - Older Adults = 0.05 – 0.12 m/sec
 - Older Adults with Heart failure = 0.05 – 0.12 m/sec
 - Pulmonary Diseases (COPD) = 0.11 m/sec (anchored against ISW)
 - Pulmonary Diseases (COPD) = 0.08 m/sec (anchored against self-reported improvement)
 - Stroke = 0.1 m/sec
 - Vestibular Disorders = 0.09 m/sec
- MDC
 - Heart failure = 0.05 m/sec
 - Joint pain and fractures = 0.08 m/sec

- Older Adults = 0.05 m/sec
- Pulmonary Diseases (COPD) = 0.11 m/sec (95% CI)
- Meaningful change for those with stroke undergoing rehab = .175 m/sec
- SEM
 - Pulmonary Diseases (COPD) = 1.14% (Interobserver)
 - Pulmonary Diseases (COPD) = 1.5% (Test-retest reliability)
- SMC = .5m/sec
- Substantial meaningful change = .10m/sec

NOTE: COPD – Chronic Obstructive Pulmonary Disease

Global Rating of Change (GRoC) [47, 48]

([‡]See Note below)

- MCIC
 - 2 points on 11-point scale
- MDC
 - 0.45 points on 11-point scale
- MIC
 - Low Back Pain = 2.5 points on 11-point scale

***NOTE: Questionable Outcome tool: Global Rating of Change (GRoC)**

Further work is needed to determine the true value of the GRoC as an outcome measure and in turn as an anchor measure. Several key points have been identified:

- There is fluctuant temporal stability of the GRoC from week to week
- There is poor correlation between the GRoC and functional measures
- The GRoC is only correlated to functional measures up to 3 weeks

Goal Attainment Scale (GAS) [49]

- MDC
 - Cerebral Palsy (Pediatric) = 2.040 (Low Response Group)
 - Cerebral Palsy (Pediatric) = 1.275 (High Response Group)
- SEM
 - Cerebral Palsy (Pediatric) = 0.736 (Low Response Group)
 - Cerebral Palsy (Pediatric) = 0.460 (High Response Group)

Gross Motor Function Measure-66 (GMFM-66) [50, 51, 52]

- Clinically meaningful improvement
 - = 1.58
- MCID
 - Cerebral Palsy
 - GMFCS Level I: 1.7 -2.7
 - GMFCS Level II: 1.0-1.5

- GMFCS Level III: 0.7 – 1.2
- GMFCS Level Overall: 0.8 – 1.3

NOTE: Gross Motor Function Classification System (GMFCS)

Headache Disability Inventory (HDI) [53]

- Decrease of 29 points (95% CI) or more is considered clinically significant

Keele STarT Back Screening Tool [54, 55]

- High-risk categories: > 4 (psychosocial subscale scores)
- Medium-risk categories: > 3 (overall tool score) and < 4 (psychosocial subscale scores)
- Low-risk categories: < 3 (overall tool score)

NOTE: No MDC or MCID established

Knee Injury and Osteoarthritis Outcome Score (KOOS) [56, 57, 58, 59, 60]

- MDC
 - Athletes (mean age 25.6 ± 3.4 years)
 - Pain = 6.1
 - Symptoms = 8.5
 - ADL = 8.0
 - Sports/Rec = 5.8
 - QoL = 7.2
 - Joint Pain and Fractures = 8 – 10 point change may represent minimal perceptible clinical improvement
 - Knee Ligament Injury
 - ACL (KOOS subscales)
 - Symptoms = 8.5
 - Pain = 6.1
 - ADL = 8.0
 - Sports/recreation = 5.8
 - QoL = 7.2
 - Articular Cartilage Lesion (KOOS subscales)
 - Symptoms = 11.8
 - Pain = 11.2
 - ADL = 11.1
 - Sports/recreation = 12.1
 - QoL = 8.7
 - Focal Cartilage Repair (KOOS subscales)
 - Symptoms = 5
 - Pain = 6
 - ADL = 7
 - Sports/recreation = 12

- QoL = 7
 - OA and No Indication for Joint Replacement (KOOS subscales)
 - Symptoms = 15.5
 - Pain = 13.4
 - ADL = 15.4
 - Sports/recreation = 19.6
 - QoL = 21.1
 - Meniscal Injury (with and without surgery) (KOOS subscales)
 - Symptoms = 19.4
 - Pain = 25.7
 - ADL = 20.2
 - Sports/recreation = 35.0
 - QoL = 26.2
- Older individuals (KOOS subscales) = ≥ 20 points
- Osteoarthritis and Joint Replacement = 8 – 10 point change may represent minimal perceptible clinical improvement
- Younger individuals (KOOS subscales) = 14.3 – 19.6 points
- MCID
 - Knee
 - Arthroplasty (total knee, post)
 - Function = 15.
 - Pain = 13.5 2
 - QOL = 8.0
 - Autologous Chondrocyte Implantation (ACI) (KOOS subscale)
 - Symptoms = could not be calculated
 - Pain = 11 – 18.8
 - ADL = 2 – 17.3
 - Sports/recreation = 5 – 18.6
 - QoL = 8 – 19.6
 - Meniscal repair (Post arthroscopic)
 - Symptoms = 12.3
 - Pain = 11.8
 - ADL = 11.4
 - Sports/recreation = 16.7
 - QoL = 16.9
 - Osteochondral Allograft Transplantation (OCA) (KOOS subscales)
 - Symptoms = could not be calculated
 - Pain = 7
 - ADL = could not be calculated
 - Sports/recreation = 25
 - QoL = could not be calculated

- Sports/recreation = 10.8
 - QoL = 7.4
- Meniscal Injury (with/without Meniscal Surgery) (KOOS subscales)
 - Symptoms = 7.0
 - Pain = 9.3
 - ADL = 7.3
 - Sports/recreation = 12.6
 - QoL = 9.5
- Knee OA (KOOS subscales)
 - Mild OA with ACL Reconstruction
 - Symptoms = 9.0
 - Pain = 7.2
 - ADL = 5.2
 - Sports/recreation = 9.0
 - QoL = 7.4
 - Moderate OA with High Tibial Osteotomy (HTO) and Valgus Correction (KOOS subscales)
 - Symptoms = 8.0
 - Pain = 9.0
 - ADL = 5.8
 - Sports/recreation = 11.6
 - QoL = 7.4
 - OA with TKA Revision (KOOS subscales)
 - Symptoms = 7.2
 - Pain = 10.1
 - ADL = 11.7
 - Sports/recreation = 24.6
 - QoL = 10.8

NOTE: ACL – Anterior Cruciate Ligament; ADL – Activities of Daily Living; OA – Osteoarthritis; QoL – Quality of Life

Knee Outcome Survey (KOS) [61]

- MCID
 - ADL = 7.1 percentage points change
- MDC [62]
 - = 11.4

NOTE: ADL – Activities of Daily Living

Lower Extremity Functional Scale (LEFS) [63, 64, 65, 66]

- MCID
 - Ankle sprains = 4 points

- Joint Pain and Fractures
 - ACL reconstruction = 9 points
 - Arthroplasty
 - Total knee = 9 points
 - Total hip = 9 points
 - Hip Impairment = 6 points or 11.3%
 - Lower Extremity Injury = 9 points
- Knee
 - OA = 6.3 points (0-2 months)
 - OA = 7.5 points (0-6 months)
 - OA = 12.5 points (0-12 months)
- Lower extremity musculoskeletal dysfunction = 9 points
- MDC
 - Ankle sprains = 4 points
 - Joint Pain and Fractures
 - ACL reconstruction = 8.7 points
 - Arthroplasty
 - Total knee = 9 points
 - Total hip = 9 points
 - Hip Impairment = 7 points or 11.3%
 - Lower Extremity Injury = 9 points
 - Knee
 - Anterior knee pain = 8 points
 - OA = 19.2 points (at 2 months)
 - OA = 17.6 points (at 6 months)
 - OA = 22.6 points (at 12 months)
 - Total knee arthroplasty = 9 points
 - Lower extremity musculoskeletal dysfunction = 9 points
 - OA
 - Hip = 9.9 – 10 points
 - Lower extremity = 9 points
- SEM
 - Ankle sprains = 4 points
 - Chronic Pain (Orthopaedic Rehab) = 4 points
 - Joint Pain and Fractures
 - ACL reconstruction = 3.7 points
 - Arthroplasty
 - Total knee = 3.7 points
 - Total hip = 3.7 points
 - Lower Extremity Injury = 3.9 points
 - Orthopaedic Rehab = 4 points
 - Knee

- Anterior knee pain = 0.10 points
- OA = 3.4 points
- OA = 6.9 points (at 2 months)
- OA = 6.4 points (at 6 months)
- OA = 8.2 points (at 12 months)
- Total knee arthroplasty = 3.7 points
- OA
 - Hip = 3.6 – 5.3 points
 - Orthopaedic Rehab = 4 points

NOTE: It is recommended that the LEFS be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress

NOTE: ACL – Anterior Cruciate Ligament; OA – Osteoarthritis

Lysholm Knee Rating System [67]

- MDC
 - Knee Injuries (ACL, meniscal, chondral, patellar dislocation) = 8.9 – 10.1
- SEM
 - Knee Injuries (ACL, meniscal, chondral, patellar dislocation) = 3.2 – 3.6

NOTE: ACL – Anterior Cruciate Ligament

Neck Disability Index (NDI) [68, 69, 70]

- MCID
 - Cervical radiculopathy = 7.0 – 8.5 points
 - Cervical spine fusion = 7.5 points
 - Mechanical neck disorders = 5 – 7.5 points
 - Mechanical neck disorders = 19%
 - Mechanical neck pain = 7.5 points
 - Neck Pain (non-specific) = 3.5 points
- MDC
 - = 10 – 20%
 - Cervical radiculopathy = 10.2 – 13.4 points
 - Mechanical neck disorders = 10.2 points
 - Mechanical neck disorders = 19.6%
 - Mechanical pain = 10.2 points
 - Neck pain = 5 points (90% CI)
 - Neck Pain (non-specific) = 8.4 – 10.5
- SEM
 - Cervical Radiculopathy = 4.4 – 5.7
 - Mechanical Neck Disorder = 4.3 – 8.4
 - Neck Pain (non-specific) = 3.0

NOTE: It is recommended that the Neck Disability Index be used at baseline and for every 2 weeks thereafter within the treatment program to measure progress.

NOTE: A score of 0% - 20% represents a minimal disability; usually, no treatment is indicated except for advice on posture, physical fitness, and diet. Patients often do not score the Neck Disability items as zero, once they are in treatment. The practitioner should consider the patient's prior level of function when goal writing (e.g., the patient's prior level of function would place them in the minimal disability category, their goal should not be to obtain a zero score).

Numeric Pain Rating Scale (NPRS) [71, 72]

- MCID
 - Emergency Room (acute pain) = 1.3 points
 - Low Back Pain (1 week of physical therapy) = 1.5 points
 - Low Back Pain (4 weeks of physical therapy) = 2.2 points
 - Musculoskeletal Pain (Chronic) = 1 point or 15% change
 - Pain (other; low back pain, OE, diabetic neuropathy, post-herpetic neuralgia, fibromyalgia) = 1.7 points or reduction of 27.9%
 - Post-operative
 - Abdominal surgery = 56%
 - Orthopedic surgery = 28.6%
 - Other types of surgery = 15.4%
 - Shoulder Pain = 2.17 points (surgical and nonsurgical subjects after 3-4 week of rehabilitation)
 - Spinal cord injuries (Chronic) = 1.6 – 1.80 points or 36%
- MDC
 - Low Back Pain = 2.0 points (95% CI)
- SEM
 - Low Back Pain = 1.02

Oswestry Disability Index (ODI) [73, 74, 75]

- MCIC
 - Lower back = 10 points or a 20% improvement
- MCID
 - Low back pain (anchor based, ROC) = 7.5% - 16.7%
 - Lumbar Spine Surgery (anchor based (HTI)) = 9.5 – 15.4 points
 - Lumbar Spine Surgery (anchor based (ROC)) = 11.8 – 17.9 points
 - SI Joint Fusion Surgery (anchor based (HTI)) = 19.5% average change
 - SI Joint Fusion Surgery (ROC) = 12.2% - 15.0%
 - Spinal Deformity Surgery = 15.0%
- MDC
 - Back pain = 5.9 – 6.4 points (90% CI)
 - Low back pain (subacute and chronic) = 11.1 – 15.35 (95% CI)

- Lumbar fusion = 11.7% - 15.5 % (90-95% CI)
- SEM
 - Back pain (mean duration 6 years) = 4.2 – 4.6 points
 - Low/upper back pain (< 1 year) = 2.6% - 2.8%
 - Spinal stenosis = 6.1%

NOTE: It is recommended that the Oswestry Disability Index be used at baseline and for every 2 weeks thereafter within the treatment program to measure progress.

NOTE: A score of 0% -20% represents a minimal disability; usually no treatment is indicated apart from advice on lifting, sitting posture, physical fitness, and diet. Patients often do not score the Oswestry items as zero once they are in treatment. The practitioner should consider the patient's prior level of function when goal writing (e.g., if the patient's prior level of function would place them in the minimal disability category, their goal should not be to obtain a zero score).

Pain Disability Index [76]

- MCIC
 - Low Back Pain (chronic) = decrease of 8.5 - 9.5 points

Patient Specific Functional Scale (PSFS) [77, 78, 79]

- MCID
 - Humeral fracture (proximal) = 2 or more points
 - Knee arthroplasty (total) = 3.83 – 5.13
 - Osteoarthritis (hand) = 2.2 point change
 - Spinal Stenosis = 1.34 points
 - Upper Extremity Musculoskeletal = 1.2 points
- MDC
 - Chronic pain = 2 points
 - Knee dysfunction = 1.5
 - Low Back pain = 1.4 points
 - Lower Limb Amputees = 11.2 (90% CI)
 - Neck Dysfunction and Whiplash = 2 points
 - Older adults = 2.8
 - Osteoarthritis (hand) = 1.30 (90% CI) 1.56 (95% CI)
 - Single activity score = 3 points (90% CI)
 - Spinal Stenosis = 2.4 points
- SEM
 - Chronic pain = 0.41
 - Knee dysfunction = 0.62 – 1.0
 - Knee arthroplasty (total, 3 months post-surgery) = 1.38 – 1.85
 - Lower Limb Amputees = 4.8
 - Neck dysfunction or pain = 0.43

- Older Adults = 1.0
- Osteoarthritis (hand) = 0.56
- Spinal Stenosis = 1.03

NOTE: It is recommended that the PSFS be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress

Peabody Developmental Motor Scales-2nd Edition (PDMS-2) [80, 81, 82]

- MCID
 - Intellectual disabilities (includes preschoolers) = 8.39
- MDC
 - Intellectual disabilities (includes preschoolers) = 7.76
- SEM
 - Cerebral Palsy
 - Fine Motor Quotient = 2.5
 - Gross Motor Quotient = 1.1
 - Total Motor Quotient = 1.6
 - Developmental Quotients
 - Fine Motor Quotient = 2.5
 - Gross Motor Quotient = 1.1
 - Total Motor Quotient = 1.6
 - Intellectual Disability = 1.80

Pediatric Balance Scale [83]

- MDC:
 - Cerebral Palsy
 - Dynamic = 0.96 points
 - Static = 0.79 points
 - Total = 1.59 points
- MDIC
 - Cerebral Palsy
 - Dynamic 2.92
 - Static 2.92
 - Total 5.83

Pediatric Evaluation of Disability Inventory (PEDI) [84]

- MCID
 - Caregiver Assistance
 - = 11.6 (Lickert Scale with range 8.7-14.9)
 - Functional Skills
 - = 10.9 (Lickert Scale with range 8.7-14.9)
 - Visual Analog Scale (VAS)
 - = 11.5 (mean)

- = 11.2 (Caregiver Assistance with range 6.0-15.6)
- = 11.6 (Functional Skills with range 6.0-15.6)
- Traumatic Brain Injury, Spinal Cord Injury, Lower Extremity Trauma, Non-traumatic Brain Injury, Developmental Disorders
 - = 11.6 points (mean; all 6 scales)
 - = 11.3 (mean; for Likert Scale categories)

Roland-Morris Disability Questionnaire (RMDQ) [85, 86]

- MCID
 - Low Back Pain
 - Acute, subacute, or chronic = 3.5 points
 - Detect change = 3 points or 30% of baseline score
 - Score > 7 then = 3 points
 - Score < 7 then = 30% change in score
 - Treatment of 3-6 weeks = 5 point change
- MDC
 - = 7.6 points or a 30% improvement from baseline
- SEM
 - Low Back Pain = 1.79
 - Lumbar Disc Surgery (post) = 2.0 scale points (95% CI)

NOTE: It is recommended that the RMDQ be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress.

Roll Evaluation of Activities of Life (REAL) [87]

- MDC
 - Children without Disabilities (Ages 2-18)
 - MDC
 - ADL = 15.91
 - IADL = 11.08
- SEM
 - Children without Disabilities (Ages 2-18)
 - ADL
 - Average = 5.74
 - Preschool = 1.41
 - Elementary = 3.00
 - Preadolescent = 2.45
 - Teenage = 4.00
 - IADL
 - Average = 4.00
 - Preschool = 1.73

- Elementary = 2.00
- Preadolescent = 1.41
- Teenage = 2.65
- Mean Standard Scores
 - Children with Disabilities
 - Attention Deficit Disorders: 85.08
 - Autism Spectrum Disorder: 54.53
 - Cerebral Palsy: -6.17
 - Children with Disabilities: 67.14
 - Developmental Delay: 60.34
 - Down Syndrome: 55.17
 - Learning Disabled: 76.32
 - Sensory Integration Disorders: 88.86
 - Speech Delay: 99.53

Shoulder Pain and Disability Index (SPADI) [88, 89, 90]

- MCID
 - Musculoskeletal Upper Extremity Problems = 13.2
 - Pain Upper Extremity = 8 – 10 points
 - Rotator Cuff Disease = 15.4
- MDC
 - Adhesive Capsulitis = 18
 - Arthroplasty (shoulder) = 18
 - Musculoskeletal Upper Extremity Problems = 18.1
 - Pain and Disability (shoulder) = 21.5
- MIC
 - Shoulder pain = 20 points (43% of baseline)
- SEM
 - Arthroplasty (shoulder) = 2
 - Non-specific population = 4.75 – 11.65
- SDC
 - Shoulder pain = 19.7 points

NOTE: It is recommended that the SPADI be used at baseline and for every 2 - 4 weeks or 6 - 12 visits thereafter within the treatment program to measure progress

Simple Shoulder Test (SST) [91, 92]

- MCID
 - Arthroplasty (anatomic total shoulder) (aTSA) = 1.6
 - Arthroplasty (Ream-and-run) (R&R) = 2.6
 - Arthroplasty (Reverse total shoulder) (rTSA) = 3.7
 - Arthroplasty (shoulder) = 2.4 – 3.0

- Rotator cuff disease = 8.5 – 9.7
- MDC
 - Musculoskeletal (shoulder) = 32.3 (95% CI)
- SEM
 - Musculoskeletal (shoulder) = 4.75 -11.65

Timed Up and Go (TUG) [93, 94, 95, 96, 97]

- Cut-off score indicating risk of falls
 - Adults = > 13.5 sec
 - Lower extremity amputees = > 19 sec
 - Older adults (fall clinic) = > 15 sec
 - Older adults (frail) = > 32.6 sec
 - Osteoarthritis (hip) = > 10 sec
 - PD = > 7.95 – 11.5 sec
 - Stroke (older adults) = > 14 sec
 - Vestibular disorders = > 11.1 sec
- MCID
 - Lumbar degenerative disc disease (post-surgery) = 2.1 sec (or TUG z score change of 1.5)
- MDC
 - Alzheimer disease = 4.09 sec
 - Arthroplasty (Total hip) = 1.62 sec (95% CI)
 - PD = 3.5 – 11 sec
 - Spinal cord injury = 10.8 sec (30% difference)
 - Stroke (chronic) = 2.9 sec
- SEM
 - Arthroplasty (Total hip) = 0.59 sec
 - Alzheimer's disease
 - All = 2.48 sec
 - Mild to Moderate = 1.52 sec
 - Moderately severe to Severe = 3.03 sec
 - Cerebral Palsy [98]
 - Evening trial = 0.4 sec
 - Morning trial = 0.6 sec
 - Spastic diplegia mean TUG score = 10.1 sec
 - Spastic hemiplegia mean TUG score = 8.4 sec
 - Spastic quadriplegia mean TUG score = 28 sec
 - Trials administer 5 minutes apart = 0.19 sec
 - Trials administered 1 week apart = 0.32 sec
 - PD = 1.75 sec
 - Spinal cord injury = 3.9 sec
 - Stroke (chronic) = 1.14 sec

NOTE: The Timed Up and Go test has limited ability to predict falls in community dwelling elderly and should not be used in isolation to identify individuals at high risk of falls in this setting

NOTE: PD – Parkinson’s Disease

Tinetti Performance Oriented Mobility Assessment (POMA) [99]

- Cut-Off Scores
 - Older adults = 19
 - Older adults (frail) = 11
 - PD = < 20
 - Stroke (chronic) = < 20
- MDC
 - Older adults
 - Individual assessment = 4.0 – 4.2 points
 - Group assessment = 0.7 – 0.8 points
 - Stroke = 6 points

NOTE: PD – Parkinson’s Disease

Upper Extremity Functional Index/Scale (UEFI/UEFS) [100]

- MCID
 - UEFI-20 = 8 (95% CI)
 - UEFI-15 = 6.7 (95% CI)
- MDC₉₀
 - UEFI-20 = 9.4 (95% CI)
 - UEFI-15 = 8.8 (95% CI)
 - UEFS = 9.8 (95% CI)

NOTE: UEFI-20 is a 20-item Upper Extremity Functional Index (0-80, higher scores indicate better function). UEFI-15 is a 15-item Upper Extremity Functional Index (0-100, higher scores indicate better function). UEFS is an Upper Extremity Functional Scale (8-80, lower scores indicate better function).

Visual Analog Scale (VAS) scores [101, 102]

- MCID
 - Hand surgery (post-operative) = 1.6 – 1.9
- MDC
 - Vestibular Disorders (Head Movement) = 4.57
- Minimum of a 2-point change on a 0-10 pain scale
- SEM
 - Vestibular Disorders (Head Movement) = 1.65

Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) [103, 104, 105]

- MCID
 - Arthroplasty (total knee, post)
 - Function = 9
 - Pain = 11
 - Stiffness = 8
 - Total score = 10
 - Osteoarthritis
 - Hip or knee = 12% change from baseline
 - Hip (total replacement)
 - Pain = 29.26
 - Stiffness = 25.91
 - Knee
 - 2 months = 4 – 8.8
 - 6 months = 6.6 – 6.8
 - 12 months = 1.6 – 12.0
 - Knee (total replacement)
 - 6 months = 11.5
 - 12 months = 11.5
 - Lower extremity = 17 - 22% change from baseline
- MDC
 - Knee (total replacement)
 - 6 months = 10.9 (95% CI)
 - 12 months = 15.3 (95% CI)
 - Hip (total replacement)
 - Function = 11.93
 - Pain = 21.38
 - Stiffness = 27.98
 - Osteoarthritis
 - Hip = 9.1 points (95% CI)
 - Hip and Knee pain = 3.94 (90% CI)
 - Knee
 - 2 months = 14.1 (95% CI)
 - 6 months = 15.0 (95% CI)
 - 12 months = 18.5 (95% CI)
- MIC
 - Arthroplasty (total knee, post)
 - Function = 16
 - Pain = 21
 - Stiffness = 13
 - Total score = 17

- SEM
 - Hip (total replacement)
 - Pain subscale (6 months post) = 7.71
 - Physical function (6 months post) = 4.30
 - Stiffness subscale (6 months post) = 10.10
 - Knee (total replacement)
 - 6 months = 3.9
 - 12 months = 5.5
 - Pain subscale (6 months post) = 8.08
 - Physical function (6 months post) = 4.73
 - Stiffness subscale (6 months post) = 10.50
 - Osteoarthritis
 - Hip = 3.3
 - Knee
 - 2 months = 5.1
 - 6 months = 5.4
 - 12 months = 6.7
 - Osteoarthritis (Older individuals with hip or knee)
 - Pain = 0.58
 - Physical function = 1.65
 - Stiffness = 0.62

BACKGROUND

The records must compare baseline measures to updated measures and document progress toward measurable goals as defined in Clinical Guideline and Plan of Care.

It is the responsibility of the treating practitioner to maintain a patient record that includes periodic measures of treatment response by employing valid, reliable, and relevant outcome assessment tools and include sufficient clinical documentation, so that a peer reviewer can render a reasonable determination on baseline functional status and/or treatment response.

Most individuals can expect to notice measurable improvement in pain and/or disability within 2 to 6 weeks after beginning treatment. If improvement has not occurred with 6 weeks of treatment, it is highly unlikely that continuing treatment will be helpful. When initial improvement did occur, studies showed no additional lasting improvement beyond 6 to 12 weeks of treatment. Most flare-ups resolve quickly, within a few days to 3 weeks.

When progress towards goals is such that outcome measures approximate normative data for asymptomatic populations or are indicative of mild deficits, which can typically be managed

through home exercise or other self-care, then a determination of maximum therapeutic benefit (MTB) is appropriate.

Definitions

Episode of Care

Consultation or treatment preceded and followed by at least 3 months without treatment for the same complaint.

Lasting, Sustainable Progress

Progress made by the patient has been maintained at a reasonable level over a reasonable period of time.

Maximum Therapeutic Benefit (MTB)

MTB is determined following a sufficient course of care where demonstrable improvement would be expected in a patient's health status and one or more of the following are present:

- The patient has returned to pre-clinical/pre-onset health status
- Meaningful improvement has occurred; however, there is no basis for further meaningful improvement
- Meaningful improvement has occurred and there is no basis for further in-office treatment
- The patient no longer demonstrates meaningful clinical improvement, as measured by standardized outcome assessment tools
- Meaningful improvement, as measured by standardized outcome assessment tools, has not been achieved
- There is insufficient information documented in the submitted patient record to reliably validate the response to treatment

Minimally Clinically Important Change (MCIC)

The smallest change in the outcome assessment score that the patient perceives as beneficial, i.e., clinically meaningful improvement.

Minimal Clinically Important Difference (MCID)

MCID is the smallest change in an outcome that a patient would identify as important.

Minimal Detectable Change (MDC)

The minimal detectable change is the smallest change in score than can be detected beyond random error and is dependent upon sample distribution.

Minimal Important Change (MIC)

A threshold for a minimal within-person change over time, above which patients perceive themselves as importantly changed

Outcome Measures

- Objective, measurable assessments by the clinician to determine patient progress with treatment.
- Standardized tests and measures at the onset of care establishes the baseline status of the patient, providing a means to quantify change in the patient's functioning.
- Used with other standardized tests and measures throughout the episode of care as part of periodic reexamination to provide information about whether predicted outcomes are being realized.
- Refers to the systematic collection (data gathered at multiple time points using same methods) and analysis of information that is used to evaluate the efficacy of an intervention.

Patient Acceptable Symptom State (PASS)

PASS is defined as the point at which the patient considers themselves well, recovered, and satisfied with treatment.

Smallest Detectable Change (SDC)

A value for the minimum change that needs to be observed to know that the observed change is real and not potentially a product of measurement error.

Smallest Real Change (SRC)

Meaningful improvement can occur only when there is a potential for MCIC. The timelines for improvement may not be applicable to some types of post-surgical care.

Specific, Measurable, and Functional Goals

Clearly defined goals of treatment that allow measurement of the amount and/or degree of meaningful change over time. These goals are often determined by the use of functional outcome assessment tools, as defined in Clinical Guideline, Record Keeping and Documentation Standards.

Standard Error of Measurement (SEM)

Estimates the standard error in a set of repeated scores.

Treatment Goals

Determined at the initial encounter for each episode of care between the patient and clinician. Unique for each patient's clinical presentation based on the evaluation/examination findings, outcome assessment tool results, and personal preferences.

POLICY HISTORY

Date	Summary
December 2023	<ul style="list-style-type: none">• Measurable improvement thresholds added• Editorial changes• References updated
October 2022	<ul style="list-style-type: none">• ABC - added MCID for vestibular disorders• BBS – Added MCID for subacute stroke• Functional Gait Assessment – added MCID for vestibular disorders• Gait Speed for Adults – Added MCID for vestibular disorders• Removed “older” from “Gait Speed for Older Adults”• KOOS Score – Added MCID scores• NPRS – added MCID for spinal cord injuries• Pain Disability Index – added “in individuals with chronic back pain”• PSFS – Added MDC for older adults• Added Simple Shoulder Test (SST) and MCID scores• TUG Added MDC for THA, and MCID for post DDD surgery• VAS added MCID score for hand surgery• PDI added “in individuals with chronic back pain”

References

- [1] J. Bier, W. G. Scholten-Peeters, J. B. Staal, J. Pool, M. W. van Tulder, E. Beekman, J. Knoop, G. Meerhoff and A. Verhagen, "Clinical Practice Guideline for Physical Therapy Assessment and Treatment in Patients With Nonspecific Neck Pain," *Phys Ther*, vol. 98, no. 3, pp. 162-171, 2018.
- [2] J. L. Moore, K. . Potter, K. Blankshain, S. L. Kaplan, L. C. O'Dwyer and J. E. Sullivan, "A Core Set of Outcome Measures for Adults With Neurologic Conditions Undergoing Rehabilitation: A CLINICAL PRACTICE GUIDELINE," *J Neurol Phys Ther*, vol. 42, no. 3, pp. 174-220, 2018.
- [3] Shirley Ryan Ability Lab, "Five Times Sit to Stand Test," 20 June 2013. [Online]. Available: <https://www.sralab.org/rehabilitation-measures/five-times-sit-stand-test>. [Accessed 30 November 2023].
- [4] M. Stanley, "6-Minute Walk Test (6MWT) (applied to patients who have had lower extremity total joint replacement)," 7 August 2017. [Online]. Available: <https://www.apta.org/patient-care/evidence-based-practice-resources/test-measures/6-minute-walk-test-6mwt-applied-to-patients-who-have-had-lower-extremity-total-joint-replacement>. [Accessed 25 August 2023].
- [5] J. Raad, R. Tappan, L. Petersen, S. White, C. Tefertiller, J. Kahn, SCI EDGE Taskforce, K. Hays, TBI EDGE Taskforce, K. Pelczarski, M. Potts, B. Brown, J. Hoder and PD EDGE Taskforce, "6 Minute Walk Test," 26 April 2013. [Online]. Available: <https://www.sralab.org/rehabilitation-measures/6-minute-walk-test#older-adults-and-geriatric-care>. [Accessed 28 August 2023].
- [6] Academy of Neurologic Physical Therapy, "10 Meter Walk Test (10MWT)," 2019. [Online]. Available: [https://www.neuropt.org/docs/default-source/cpgs/core-outcome-measures/10mwt-pocket-guide-proof8-\(2\)28db36a5390366a68a96ff00001fc240.pdf?sfvrsn=e4d85043_0&sfvrsn=e4d85043_0](https://www.neuropt.org/docs/default-source/cpgs/core-outcome-measures/10mwt-pocket-guide-proof8-(2)28db36a5390366a68a96ff00001fc240.pdf?sfvrsn=e4d85043_0&sfvrsn=e4d85043_0). [Accessed 30 November 2023].
- [7] T. Steffen and M. Seney, "Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-item short-form health survey, and the unified Parkinson disease rating scale in people with parkinsonism," *Phys Ther*, pp. 733-46, June 2008.
- [8] S. R. Piva, A. B. Gil, C. G. Moore and G. K. Fitzgerald, "Responsiveness of the activities of daily living scale of the knee outcome survey and numeric pain rating scale in patients with patellofemoral pain," *J Rehabil Med*, vol. 41, no. 3, pp. 129-135, 2009.
- [9] M. Szczepanik, J. Jablonski, A. Bejer, K. Bazarnik-Mucha, J. Majewska, S. Snela and D. Szymczyk, "Validation of the Polish Version of Knee Outcome Survey Activities of the Daily Living Scale in a Group of Patients after Arthroscopic Anterior Cruciate Ligament Reconstruction," *J Clin Med*, vol. 12, no. 13, p. 4317, 27 June 2023.

- [10] J. Raad, J. Moore, J. Hamby, R. L. Rivadelo and D. Straube, "A Brief Review of the Activities-Specific Balance Confidence Scale in Older Adults," *Archives of Physical Medicine and Rehabilitation*, vol. 94, no. 7, pp. 1426-1427, July 2013.
- [11] R. D. Wellons, S. E. Duhe, S. G. MacDowell, A. Hodge, S. Oxborough and E. E. Levitzky, "Estimating the minimal clinically important difference for balance and gait outcome measures in individuals with vestibular disorders," *J Vestib Res*, vol. 32, no. 3, pp. 223-233, 2022.
- [12] Shirley Ryan Ability Lab, "Activities-Specific Balance Confidence Scale," 22 March 2013. [Online]. [Accessed 30 August 2023].
- [13] Shirley Ryan Ability Lab, "Berg Balance Scale," 30 June 2020. [Online]. [Accessed 30 August 2023].
- [14] M. Botros, L. Dilorio, M. Romeo, G. Scherer, P. Trombley and C. Voltmer, "Berg Balance Scale (BBS) for Spinal Cord Injury (SCI)," 17 June 2022. [Online]. [Accessed 30 August 2023].
- [15] L. A. P. Viveiro, G. C. V. Gomes, J. M. R. Bacha, N. C. Junior, M. E. Kallas, M. Reis, W. J. Filho and J. E. Pompeu, "Reliability, Validity, and Ability to Identify Fall Status of the Berg Balance Scale, Balance Evaluation Systems Test (BESTest), Mini-BESTest, and Brief-BESTest in Older Adults Who Live in Nursing Homes," *J Geriatr Phys Ther*, vol. 42, no. 4, pp. E45-E54, 2019.
- [16] S. Tamura, K. Miyata, S. Kobayashi, R. Takeda and H. Iwamoto, "The minimal clinically important difference in Berg Balance Scale scores among patients with early subacute stroke: a multicenter, retrospective, observational study," *Top Stroke Rehabil*, vol. 29, no. 6, pp. 423-429, 2022.
- [17] D. Newell and J. E. Bolton, "Responsiveness of the Bournemouth questionnaire in determining minimal clinically important change in subgroups of low back pain patients," *Spine (Phila Pa 1976)*, vol. 35, no. 19, pp. 1801-1806, 2010.
- [18] O. Yilmaz, U. Gafuroglu and S. Yuksel, "Translation, reliability, and validity of the Turkish version of the Neck Bournemouth Questionnaire," *Turk J Phys Med Rehabil*, vol. 65, no. 1, pp. 59-66, 24 December 2018.
- [19] L. Dietz, N. Mano, S. Mazza, J. Mettus, Z. Myers, L. Savidge, M. Warminsky and M. A. Holbein-Jenny, "Bruininks-Oseretsky Test of Motor Proficiency, 2nd ed, (BOT-2)," 13 December 2019. [Online]. Available: <https://www.apta.org/patient-care/evidence-based-practice-resources/test-measures/bruininks-oseretsky-test-of-motor-proficiency>. [Accessed 25 August 2023].
- [20] Shirley Ryan Ability Lab, "Bruininks-Oseretsky Test of Motor Proficiency, Second Edition," 21 April 2017. [Online]. [Accessed 31 August 2023].
- [21] P. Mintken, "Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH) for Osteoarthritis (OA)," 15 June 2013. [Online]. [Accessed 31 August 2023].

- [22] American Physical Therapy Association, "Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH) for Shoulder Conditions," 15 June 2013. [Online]. [Accessed 31 August 2023].
- [23] Shirley Ryan Ability Lab, "Disabilities of the Arm, Shoulder, and Hand Questionnaire," 17 October 2021. [Online]. [Accessed 31 August 2023].
- [24] P. Mintken, "QuickDASH," 25 May 2017. [Online]. [Accessed 31 August 2023].
- [25] J. Sullivan, "Dizziness Handicap Inventory (DHI) for Vestibular Disorders," 22 June 2013. [Online]. [Accessed 31 August 2023].
- [26] Shirley Ryan Ability Lab, "Dizziness Handicap Inventory," 29 July 2013. [Online]. [Accessed 31 August 2023].
- [27] D. Scalzitti, "Dynamic Gait Index (DGI) for Vestibular Disorders," 14 May 2013. [Online]. [Accessed 31 August 2023].
- [28] J. Sullivan, "Dynamic Gait Index (DGI) for Stroke," 20 June 2013. [Online]. [Accessed 31 August 2023].
- [29] American Physical Therapy Association, "Dynamic Gait Index for Parkinson Disease," 2 June 2014. [Online]. [Accessed 31 August 2023].
- [30] D. Matlick, "Dynamic Gait Index (DGI)," August 2021. [Online]. [Accessed 31 August 2023].
- [31] Shirley Ryan Ability Lab, "Dynamic Gait Index," 18 February 2020. [Online]. [Accessed 31 August 2023].
- [32] Shirley Ryan Ability Lab, "Falls Efficacy Scale – International," 11 August 2017. [Online]. [Accessed 31 August 2023].
- [33] J. H. Visschedijk, C. B. Terwee, M. A. Caljouw, M. Spruit-van Eijk, R. van Balen and W. P. Achterberg, "Reliability and validity of the Falls Efficacy Scale-International after hip fracture in patients aged ≥ 65 years," *Disabil Rehabil*, vol. 37, no. 23, pp. 2225-2232, 2015.
- [34] Shirley Ryan Ability Lab, "Foot and Ankle Ability Measures," 15 December 2015. [Online]. [Accessed 31 August 2023].
- [35] R. L. Martin, J. J. Irrgang, R. G. Burdett, S. F. Conti and J. M. Van Swearingen, "Evidence of validity for the Foot and Ankle Ability Measure (FAAM)," *Foot Ankle Int.*, vol. 26, no. 11, pp. 968-983, 2005.
- [36] P. Mintken, "Fear Avoidance Beliefs Questionnaire (FABQ)," 2 October 2014. [Online]. [Accessed 31 August 2023].
- [37] Shirley Ryan Ability Lab, "Fear-Avoidance Beliefs Questionnaire," 26 June 2014. [Online]. [Accessed 23 August 2023].
- [38] L. Sorensen, M. van Tulder, H. V. Johannsen, J. Ovesen and L. G. Oestergaard, "Responsiveness and minimal important change of the Oxford Shoulder Score, EQ-5D, and the Fear-Avoidance Belief Questionnaire Physical Activity subscale in patients

- undergoing arthroscopic subacromial decompression," *JSES Int*, vol. 5, no. 5, pp. 869-874, 9 July 2021.
- [39] Shirley Ryan Ability Lab, "Functional Gait Assessment," 09 November 2016 . [Online]. [Accessed 31 August 2023].
- [40] M. Beninato, A. Fernandes and L. S. Plummer, "Beninato M, Fernandes A, Plummer LS. Minimal clinically important difference of the functional gait assessment in older adults. *Phys Ther*. Nov 2014;94(11):1594-603. doi:10.2522/ptj.20130596," *Phys Ther*, vol. 94, no. 11, pp. 1594-1603, 2014.
- [41] R. Feise and M. J. Menke, "Functional Rating Index: literature review," *Functional Rating Index: literature review*, vol. 16, no. 2, pp. RA25-RA36, 2010.
- [42] P. L. Gozalo, L. J. Resnik and B. Silver, "Benchmarking Outpatient Rehabilitation Clinics Using Functional Status Outcomes," *Health Serv Res*, vol. 51, no. 2, pp. 768-789, 2016.
- [43] R. Burgess, M. Lewis and J. C. Hill, "Musculoskeletal case-mix adjustment in a UK primary/community care cohort: Testing musculoskeletal models to make recommendations in this setting," *Musculoskelet Sci Pract*, vol. 56, p. 102455, 2021.
- [44] Shirley Ryan Ability Lab, "Gait Speed," 13 October 2016. [Online]. [Accessed 31 August 2023].
- [45] G. Pulignano, D. Del Sindaco, A. Di Lenarda, G. Alunni, M. Senni, L. Tarantini, G. Cioffi, M. D. Tinti, G. Barbati, G. Minardi, M. Uguccioni and IMAGE-HF Study Investigators, "Incremental Value of Gait Speed in Predicting Prognosis of Older Adults With Heart Failure: Insights From the IMAGE-HF Study," *JACC Heart Fail*, vol. 4, no. 4, pp. 289-298, 2016.
- [46] K. M. Palombaro, R. L. Craik, K. K. Mangione and J. D. Tomlinson, "Determining meaningful changes in gait speed after hip fracture," *Phys Ther*, vol. 86, no. 6, pp. 809-816, 2006.
- [47] P. Bobos, C. Ziebart, R. Furtado, Z. Lu and J. C. MacDermid, "Garrison C, Cook C. Clinimetrics corner: the Global Rating of Change Score (GROC) poorly correlates with functional measures and is not temporally stable. *J Man Manip Ther*. 2012;20(4):178-181. doi:10.1179/1066981712Z.00000000022," *J Orthop*, vol. 21, pp. 40-48, 10 Feb 2020.
- [48] C. Garrison and C. Cook, "Clinimetrics corner: the Global Rating of Change Score (GROC) poorly correlates with functional measures and is not temporally stable," *J Man Manip Ther*, vol. 20, no. 4, pp. 178-181, 2012.
- [49] Shirley Ryan Ability Lab, "Goal Attainment Scale," 1 July 2020. [Online]. Available: <https://www.sralab.org/rehabilitation-measures/goal-attainment-scale#pediatric-disorders>. [Accessed 30 November 2023].
- [50] Shirley Ryan Ability Lab, "Gross Motor Function Measure- 66," 30 April 2017. [Online]. [Accessed 31 August 2023].

- [51] B. A. MacWilliams, S. Prasad, A. L. Shuckra and M. H. Schwartz, "Causal factors affecting gross motor function in children diagnosed with cerebral palsy," *PLoS One*, vol. 17, no. 7, p. e0270121, 18 July 2022.
- [52] H.-Y. Wang and Y. H. Yang, "Evaluating the responsiveness of 2 versions of the gross motor function measure for children with cerebral palsy," *Arch Phys Med Rehabil*, vol. 87, no. 1, pp. 51-56, 2006.
- [53] G. P. Jacobson, N. M. Ramadan, S. K. Aggarwal and C. W. Newman, "The Henry Ford Hospital Headache Disability Inventory (HDI)," *Neurology*, vol. 44, no. 5, pp. 837-842, 1994.
- [54] P. Mintken, "Subgroups for Targeted Treatment (STarT) Back Tool," 31 August 2017. [Online]. [Accessed 31 August 2023].
- [55] Shirley Ryan Ability Lab, "STarT Back Screening Tool," 12 April 2016. [Online]. [Accessed 31 August 2023].
- [56] Shirley Ryan Ability Lab, "Knee Injury and Osteoarthritis Outcome Score," 2 April 2012. [Online]. [Accessed 31 August 2023].
- [57] F. Quinones, M. Rousseva, J. Makkappallil, K. L. Miller and K. A. Luedtke-Hoffmann, "Knee Injury and Osteoarthritis Outcome Score (KOOS)," 7 October 2020. [Online]. [Accessed 31 August 2023].
- [58] A. Boffa, L. Andriolo, M. Franceschini, A. Di Martino, E. Asunis, A. Grassi, S. Zaffagnini and G. Filardo, "Minimal Clinically Important Difference and Patient Acceptable Symptom State in Patients With Knee Osteoarthritis Treated With PRP Injection," *Minimal Clinically Important Difference and Patient Acceptable Symptom State in Patients With Knee Osteoarthritis Treated With PRP Injection*, vol. 9, no. 10, 5 October 2021.
- [59] N. J. Collins, C. A. C. Prinsen, R. Christensen, E. M. Bartels, C. B. Terwee and E. M. Roos, "Knee Injury and Osteoarthritis Outcome Score (KOOS): systematic review and meta-analysis of measurement properties," *Osteoarthritis Cartilage*, vol. 24, no. 8, pp. 1317-1329, 2016.
- [60] B. Maheshwer, S. E. Wong, E. M. Polce, K. Paul, B. Forsythe, C. Bush-Joseph, B. R. Bach, A. B. Yanke, B. J. Cole, N. N. Verma and J. Chahla, "Establishing the Minimal Clinically Important Difference and Patient-Acceptable Symptomatic State After Arthroscopic Meniscal Repair and Associated Variables for Achievement," *Arthroscopy*, vol. 37, no. 12, pp. 3479-3486, 2021.
- [61] S. R. Piva, A. B. Gil, C. G. Moore and G. K. Fitzgerald, "Responsiveness of the activities of daily living scale of the knee outcome survey and numeric pain rating scale in patients with patellofemoral pain," *J Rehabil Med*, vol. 41, no. 3, pp. 129-135, 2009.
- [62] N. Collins, D. Misra, D. Felson, K. Crossley and E. Roos, "Measures of knee function," *Arthritis Care Res (Hoboken)*, vol. 63, no. Suppl 11, pp. S208-28, Nov 2011.
- [63] P. Mintken and D. Scalzitti, "Lower Extremity Functional Scale (LEFS) for Ankle Disorders," 24 September 2013. [Online]. [Accessed 31 August 2023].

- [64] D. Scalzitti, "Lower Extremity Functional Scale (LEFS) for Hip Disorders," 25 September 2013. [Online]. [Accessed 31 August 2023].
- [65] P. Mintken and D. Scalzitti, "Lower Extremity Functional Scale (LEFS) for Knee Disorders," 25 September 2013. [Online]. [Accessed 31 August 2023].
- [66] Shirley Ryan Ability Lab, "Lower Extremity Functional Scale," 27 November 2013. [Online]. [Accessed 31 August 2023].
- [67] N. J. Collins, D. Misra, D. T. Felson, K. M. Crossley and E. M. Roos, "Measures of knee function: International Knee Documentation Committee (IKDC) Subjective Knee Evaluation Form, Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Knee Ou," *Arthritis Care Res (Hoboken)*, vol. 63, no. Suppl 11, pp. S208-S228, 2011.
- [68] P. Mintken, "Neck Disability Index (NDI)," 12 June 2013. [Online]. [Accessed 31 August 2023].
- [69] Shirley Ryan Ability Lab, "Neck Disability Index," 10 September 2015. [Online]. [Accessed 31 August 2023].
- [70] J. C. MacDermid, D. M. Walton, S. Avery, A. Blanchard, E. Etruw, C. McAlpine and C. H. Goldsmith, "Measurement properties of the neck disability index: a systematic review," *J Orthop Sports Phys Ther*, vol. 39, no. 5, pp. 400-417, 2009.
- [71] Shirley Ryan Ability Lab, "Numeric Pain Rating Scale," 17 January 2013. [Online]. [Accessed 31 August 2023].
- [72] M. Sobreira, M. Almeida, A. Gomes, M. Lucas, A. Oliveira and A. Marquez, "Minimal Clinically Important Differences for Measures of Pain, Lung Function, Fatigue, and Functionality in Spinal Cord Injury," *Phys Ther*, vol. 101, no. 2, p. pzaa210, 2021.
- [73] Shirley Ryan Ability Lab, "Oswestry Disability Index," 27 November 2013. [Online]. [Accessed 31 August 2023].
- [74] R. Dinger, K. Krupski, E. Jordan, J. Timko, C. Hernandez, G. Hughes, M. A. Holbein and M. A. Holbein-Jenny, "Oswestry Low Back Pain Disability Index, Oswestry Low Back Pain Disability Questionnaire (ODI, ODQ)," 16 May 2019. [Online]. [Accessed 31 August 2023].
- [75] R. Smeets, A. Koke, C.-W. Lin, M. Ferreira and C. Demoulin, "Measures of function in low back pain/disorders: Low Back Pain Rating Scale (LBPRS), Oswestry Disability Index (ODI), Progressive Isoinertial Lifting Evaluation (PILE), Quebec Back Pain Disability Scale (QBPDs), and Roland-Morris Disability Questionnaire," *Arthritis Care Res (Hoboken)*, vol. 63, no. Suppl 11, pp. S158-S173, 2011.
- [76] R. Soer, M. Reneman, P. C. Vroomen, P. Stegeman and M. H. Coppes, "Responsiveness and minimal clinically important change of the Pain Disability Index in patients with chronic back pain," *Spine (Phila Pa 1976)*, vol. 37, no. 8, pp. 711-715, 2012.
- [77] Shirley Ryan Ability Lab, "Patient Specific Functional Scale," 04 April 2013. [Online]. [Accessed 31 August 2023].

- [78] American Physical Therapy Association, "Patient Specific Functional Scale (PSFS)," 2 October 2014. [Online]. [Accessed 31 August 2023].
- [79] P. Heldmann, S. Hummel, L. Bauknecht, J. M. Bauer and C. Werner, "Construct Validity, Test-Retest Reliability, Sensitivity to Change, and Feasibility of the Patient-Specific Functional Scale in Acutely Hospitalized Older Patients With and Without Cognitive Impairment," *J Geriatr Phys Ther*, vol. 45, no. 3, pp. 134-144, 2022.
- [80] S. Westcott, "Peabody Developmental Motor Scales, Second Edition (PDMS-2)," 27 January 2017. [Online]. [Accessed 31 August 2023].
- [81] Shirley Ryan Ability Lab, "Peabody Developmental Motor Scales-Second Edition," 24 April 2016. [Online]. [Accessed 31 August 2023].
- [82] Y. P. Wuang, C. Y. Su and M. H. Huang, "Psychometric comparisons of three measures for assessing motor functions in preschoolers with intellectual disabilities," *J Intellect Disabil Res*, vol. 56, no. 6, pp. 567-578, 2012.
- [83] Shirley Ryan Ability Lab, "Pediatric Balance Scale," 04 September 2015. [Online]. [Accessed 31 August 2023].
- [84] Shirley Ryan Ability Lab, "Pediatric Evaluation of Disability Inventory," 22 March 2017. [Online]. Available: <https://www.sralab.org/rehabilitation-measures/pediatric-evaluation-disability-inventory>. [Accessed 30 November 2023].
- [85] Shirley Ryan Ability Lab, "Roland-Morris Disability Questionnaire," 10 September 2015. [Online]. [Accessed 31 August 2023].
- [86] R. Froud, S. Eldridge and M. Underwood, "MINIMALLY IMPORTANT CHANGE ON THE ROLAND MORRIS DISABILITY QUESTIONNAIRE," *Orthopaedic Proceedings*, Vols. 92-B, no. Supp_1, pp. 233-233, 01 March 2010.
- [87] Shirley Ryan Ability Lab, "Roll Evaluation of Activities of Life," 14 April 2018. [Online]. Available: <https://www.sralab.org/rehabilitation-measures/roll-evaluation-activities-life>. [Accessed 30 November 2023].
- [88] Shirley Ryan Ability Lab, "Shoulder Pain And Disability Index," 09 September 2015. [Online]. [Accessed 31 August 2023].
- [89] A. Reicherter, "Shoulder Pain and Disability Index (SPADI)," 30 August 2017. [Online]. [Accessed 31 August 2023].
- [90] M. Thoomes-de Graaf, W. Scholten-Peeters, E. Duijn, Y. Karel, H. C. de Vet, B. Koes and A. Verhagen, "The Responsiveness and Interpretability of the Shoulder Pain and Disability Index," *J Orthop Sports Phys Ther*, vol. 47, no. 4, pp. 278-286, 2017.
- [91] Shirley Ryan Ability Lab, "Simple Shoulder Test," 30 April 2017. [Online]. [Accessed 31 August 2023].
- [92] R. J. McLaughlin, A. J. Whitson, A. . Panebianco, W. J. Warme, F. A. Matsen 3rd and J. E. Hsu, "McLaughlin RJ, Whitson AJ, Panebianco A, Warme WJ, Matsen FA, 3rd, Hsu JE. The minimal clinically important differences of the Simple Shoulder Test are different for

- different arthroplasty types. *J Shoulder Elbow Surg.* Aug 2022;31(8):1640-1646. doi:10.101, " *J Shoulder Elbow Surg*, vol. 31, no. 8, pp. 1640-1646, 2022.
- [93] G. Fulk, "Timed Up and Go Test (TUG, TUGT) (applied to patients with spinal cord injury)," 24 May 2017. [Online]. [Accessed 31 August 2023].
- [94] American Physical Therapy Association, "Timed Up and Go (TUG) for Parkinson Disease (PD)," 21 January 2013. [Online]. [Accessed 31 August 2023].
- [95] Shirley Ryan Ability Lab, "Timed Up and Go," 06 November 2013. [Online]. [Accessed 31 August 2023].
- [96] E. . Yuksel, B. unver, S. Kalkan and V. Karatosun, "Reliability and minimal detectable change of the 2-minute walk test and Timed Up and Go test in patients with total hip arthroplasty," *Hip Int*, vol. 31, no. 1, pp. 43-49, 2021.
- [97] N. Maldaner, M. Sosnova, M. Ziga, A. M. Zeitzberger, O. Bozinov, O. P. Gautschi, A. Weyerbrock, L. Regli and M. N. Stienen, "External Validation of the Minimum Clinically Important Difference in the Timed-up-and-go Test After Surgery for Lumbar Degenerative Disc Disease," *Spine (Phila Pa 1976)*, vol. 47, no. 4, pp. 337-342, 2022.
- [98] G. Fulk, "Timed Up and Go (TUG) for Cerebral Palsy," 29 October 2014. [Online]. [Accessed 31 August 2023].
- [99] Shirley Ryan Ability Lab, "Tinetti Performance Oriented Mobility Assessment," 13 January 2014. [Online]. [Accessed 31 August 2023].
- [100] B. Chesworth, C. Hamilton, D. Walton, M. Denoit, T. Blake, H. Bredy, C. Burns and et al., "Reliability and validity of two versions of the upper extremity functional index," *Physiother Can*, vol. 66, no. 3, pp. 243-53, 2014.
- [101] Shirley Ryan Ability Lab, "Visual Analog Scale," 15 April 2013. [Online]. [Accessed 31 August 2023].
- [102] D. J. Randall, Y. Zhang, H. . Li, J. C. hubbard and N. H. Kazmers, "Establishing the Minimal Clinically Important Difference and Substantial Clinical Benefit for the Pain Visual Analog Scale in a Postoperative Hand Surgery Population," *Establishing the Minimal Clinically Important Difference and Substantial Clinical Benefit for the Pain Visual Analog Scale in a Postoperative Hand Surgery Population*, vol. 47, no. 7, pp. 645-653, 2022.
- [103] B. Reynolds and P. Mintken, "Clement ND, Bardgett M, Weir D, Holland J, Gerrand C, Deehan DJ. What is the Minimum Clinically Important Difference for the WOMAC Index After TKA? *Clin Orthop Relat Res.* Oct 2018;476(10):2005-2014. doi:10.1097/corr.000000000000444," 28 June 2017. [Online]. [Accessed 31 August 2023].
- [104] Shirely Ryan Ability Lab, "Western Ontario and McMaster Universities Osteoarthritis Index," 26 July 2016. [Online]. [Accessed 31 August 2023].
- [105] N. D. Clement, M. Bardgett, D. Weir, J. Holland, C. Gerrand and D. J. Deehan, "What is the Minimum Clinically Important Difference for the WOMAC Index After TKA?"

[published correction appears in Clin Orthop Relat Res," *Clin Orthop Relat Res*, vol. 476, no. 10, pp. 2005-2014, 2018.

Reviewed / Approved by Clinical Guideline Committee

Disclaimer: *Evolut Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment and medical advice. Evolut uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolut Clinical Guidelines. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolut reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. **Members should contact their Plan customer service representative for specific coverage information.***