

Using Outcome Measures in the Clinic

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Outcome measures are a way for clinicians to measure clinical change in patients over time. There have been many outcome measures that have been validated in the literature. This document will outline some of the common terms that are used in the literature as well as tables to summarize commonly used outcome measures. The summaries will include: a description of the scales, how the scores are interpreted, significant statistical values, and intended use.

Glossary of terms:

Reliability: describes the consistency of a measure. High reliability in a measure is found if it produces similar results under consistent conditions.

Validity: describes whether the outcome measure is a true measure of what it intended to study (ie. are the results applicable to the intended patient population)

Specificity: is a measure of true negatives (ie. how many people were correctly identified as not having the condition using the measure, who do not have the condition).

Sensitivity: is a measure of true positives (ie. how many people were correctly identified with the condition using the measure, who actually have the condition).

Minimal Detectable Change (MDC): is the amount of change required to be reasonably certain that true change has occurred and is not due to error.

Minimal Clinically Important Difference (MCID): is the minimum amount of change that is needed to be meaningful to the patient.

Outcome Measure	Psychometric Properties	Strengths/ Uses	Description/Limitations
Patient-Specific Functional Scale (PSFS)	Test -retest reliability ICC: 0.71-0.87 ²⁻⁴ MCID: 1-3 points depending on population: <ul style="list-style-type: none"> • Neck/Upper Extremity Musculoskeletal: 1 point for average score^{1,4}. • Cervical radiculopathy: 2 points². • Knee: 3 points for average score³. MDC: 2 points ^{2,3} for average score, 3 points for single activity score	Designed to measure disability in people with an orthopaedic condition. Validated for neck dysfunction, upper extremity musculoskeletal dysfunction, cervical radiculopathy and knee dysfunction. Measures activity limitation, participation restriction and impairment within ICF classification.	Total score= sum of activity scores/number of activities. Scored from 0-10 for each activity,
Orebro Musculoskeletal Pain Questionnaire (OMPQ)	Reliability (0.975) ¹ for all body regions. Sensitivity=89%, Specificity=65% (using a 90 point cut-off score) for absenteeism due to sickness. Sensitivity=74%, specificity=79% for functional ability.	Assesses the risk that a worker will develop long-term disability or fail to return to work following a musculoskeletal injury. Possible risk factors can be identified allowing for early intervention to reduce the risk of long-term disability. Can be used for all body regions (spine, upper extremities, lower extremities).	Consists of 21 questions. Addresses psychosocial factors that may influence recovery and return to work. Ideally completed 4-12 weeks following a musculoskeletal injury.

Outcome Measure	Psychometric Properties	Strengths/ Uses	Description/Limitations
Neck Disability Index (NDI)	<p>Test/retest reliability ($r=0.48-0.99$)⁴ (majority >0.9 various sources)</p> <p>MCID 3-10 points (7 points)^{4,5} MDC $<2-10$ points (most common 5 points, 90% CI)^{4,5}</p>	<p>Useful predictor of chronicity: score $>20/50$ at initial assessment is associated with ongoing pain and disability in WAD patients¹.</p> <p>0 and 4 represents no disability, 5-14 mild disability, 15-24 moderate disability, 25-34 severe disability > 35 complete disability¹.</p> <p>Individuals who have recovered score ≤ 8, those with mild disability score 10-28, those with moderate to severe disability score $>30$².</p> <p>Measures activity limitation, participation restriction and impairment within ICF classification.</p>	<p>10 items on a 6 point scale (0-5): 7 related to ADL, 2 related to pain, and 1 related to concentration.</p> <p>Score range 0 (no disability) to 50 (full disability). The total of the items is expressed as a percentage. In the literature the score is usually expressed out of 50.</p> <p>May be a floor/ceiling effect with scores of 0-10 and 40-50, and may supplement with another outcome measure⁴.</p>
Disabilities of the Arm, Shoulder and Hand. (DASH/QuickDASH)	<p>Test/retest reliability ICC = 0.96 (95% CI 0.93-0.98)¹ SEM 4.6 points¹ MCID 15 points¹ MDC 8-17 points (mean 13). MCD 10.7 points (90% CI)¹</p>	<p>Measures physical function and symptoms in individuals with musculoskeletal disorders of the upper limb.</p> <p>Tested in subgroups: Rheumatoid Arthritis, Carpal Tunnel Syndrome, distal radioulnar joint fractures, shoulder pathology.</p> <p>Measures activity limitation and participation restriction within ICF classification.</p>	<p>DASH is a 30 item self-report questionnaire. Optional work module and sports/ performing arts module each consist of 4 items.</p> <p>QuickDASH main scale consists of 11 items. Optional work and sports/performing arts modules as above.</p> <p>Scored on a 5 point scale (1-5). Score range 0 to 100. Higher scores indicate more impairment of physical function/symptoms.</p> <p>Requires some calculation to determine score.</p>
Upper Extremity Functional Index (UEFI)	<p>Test/retest reliability ICC: 0.85²-0.95 MCID 9-10 points² MCD 9 points (90% CI)¹</p>	<p>Measures disability in individuals with upper extremity orthopaedic conditions.</p> <p>Measures activity limitation and participation restrictions within the ICF classification.</p> <p>Validated in upper extremity dysfunction or shoulder impingement/post-surgical.</p>	<p>20 item self-report questionnaire. Scored on a 5 point scale (0-4).</p> <p>Score 0-80 with higher scores indicating less functional difficulty.</p> <p>May be a ceiling effect with this measure. May need to supplement with another measure ie PSFS.</p>
Shoulder Pain and Disability Index (SPADI)	<p>Test-retest reliability ICC: 0.84-0.94¹ SEM = 7.75¹ MDC = 18¹ MCID 8-13¹</p>	<p>Shoulder specific measure.</p>	<p>Self-administered questionnaire. 2 dimensions: pain (5 questions) and functional activities (8 questions).</p> <p>Pain scored on an 11 point scale (0-10), score out of 50. Disability (0-10) 8 questions, score out of 80. Total score pain score + disability score out of 130.</p>

Outcome Measure	Psychometric Properties	Strengths/ Uses	Description/Limitations
Patient-Rated Tennis Elbow Evaluation (PRTEE)	<p>Reliability: Whole scale ICC = 0.89 (95% CI +/- 1.2)¹ Pain subscale ICC = 0.89 (95% CI +/- 1.2)¹ Function subscales = 0.83 (95% CI +/-1.7)¹</p> <p>SEM pain 0.6, function 0.9¹</p> <p>Clinical significance (MCID):¹ Defined as “a little better” 7/100 (22% of baseline score). Defined as much “much better”/”completely recovered” 11/100 (37% of baseline score).</p>	<p>Measures forearm pain and disability in patients with lateral epicondylitis.</p>	<p>Consists of 5 pain and 10 function questions.</p> <p>Total score out of 100 = Pain score (sum of 5 items) + disability score (sum of ten items, divided by 2). Two subscales: 1) PAIN subscale (0=no pain, 10=worse pain) total score 0-50 2) FUNCTION subscale (0=no difficulty, 10=unable to do). 6 items for specific activities. 4 items for usual activities</p> <p>Substantial changes in scores are required before they can be considered clinically significant</p>
Modified Oswestry Low Back Pain Questionnaire	<p>Internal Consistency: α range 0.71 to 0.83¹</p> <p>Test-retest reliability: $r = 0.83-0.99$¹</p> <p>SEM = 5.40 (95% CI = 4.35-7.22)³</p> <p>MCID = 6 points (sensitivity = 91% [95% CI = 82%-99%], specificity = 83% [95% CI = 67%-98%])³</p>	<p>Validated measure responsive to chronic low back pain.</p> <p>Measures activity and participation restrictions within ICF classification</p>	<p>10 questions on a 6 point scale (0-5)</p> <p>Score range from 0 (no disability) to 50 (full disability)</p> <p>Has not been validated for acute low back pain in the literature.</p>
Lower Extremity Functional Scale (LEFS)	<p>Test-retest Reliability (all subjects): $r = 0.86$ (95% CI=0.8)²; chronic subset $r = 0.94$ (95% CI = 0.89)²</p> <p>MDC = 8.2 to 9 points (90% CI)^{1,2}</p> <p>SEM = 3.5 points (95% CI = 2.7-4.9)¹</p> <p>MCID = 9 points²</p>	<p>Measures the functional status of patients with any lower extremity musculoskeletal condition.</p> <p>Measures activity (emphasis on mobility) and participation restrictions within ICF classification.</p> <p>Validated for patients with TKA, ankle sprains, inpatient and outpatient lower extremity MSK disorders.</p>	<p>20 questions scored on a 5 point scale (0-4).</p> <p>Total score is calculated by summing the 20 questions; total scores range from 0-80.</p> <p>Higher scores indicate less functional difficulty.</p>
Anterior Knee Pain Scale (AKPS)	<p>MDC = 7 , 10, 14 (various sources)¹</p>	<p>Validated measure for patients with anterior knee pain.</p> <p>Watson et. al. 2005 found that the reliability and responsiveness of the LEFS was slightly higher than the AKPS</p>	<p>13 item, 100 point questionnaire.</p> <p>Lower scores indicate greater pain/disability. Score of 70 is considered moderate disability.</p> <p>Focus of this measure is on pain and not function or participation</p> <p>Some questions may be unclear to the patient.</p> <p>Does not include kneeling as an item</p>

Outcome Measure	Psychometric Properties	Strengths/ Uses	Description/Limitations
Foot and Ankle Ability Measure (FAAM)	<p>Reliability:</p> <ul style="list-style-type: none"> ADL subscale: ICC = 0.89; SEM = 2.1 points¹ Sport subscale: ICC = 0.87; SEM = 4.5 points¹ <p>MDC:</p> <ul style="list-style-type: none"> ADL = 6 points (95% CI)¹ Sport = 12 points (95% CI)¹ <p>MCID:</p> <ul style="list-style-type: none"> ADL = 8 points¹ Sport = 9 points¹ 	<p>Validated to measure physical function in individuals with diabetes and foot and/or ankle related disorders.</p> <p>Suggested uses: chronic ankle instability, heel pain/plantar fasciitis, RA and OA of the foot/ankle, sprains, and fractures</p> <p>Measures activity and participation restrictions within the ICF classification</p>	<p>29 total items, 8 items in a sports subscale and 21 items in an ADL subscale.</p> <p>Score by adding all the completed responses, then multiply by 4.</p> <p>5 point Likert scale 0 to 4. Lower scores mean higher disability</p>

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