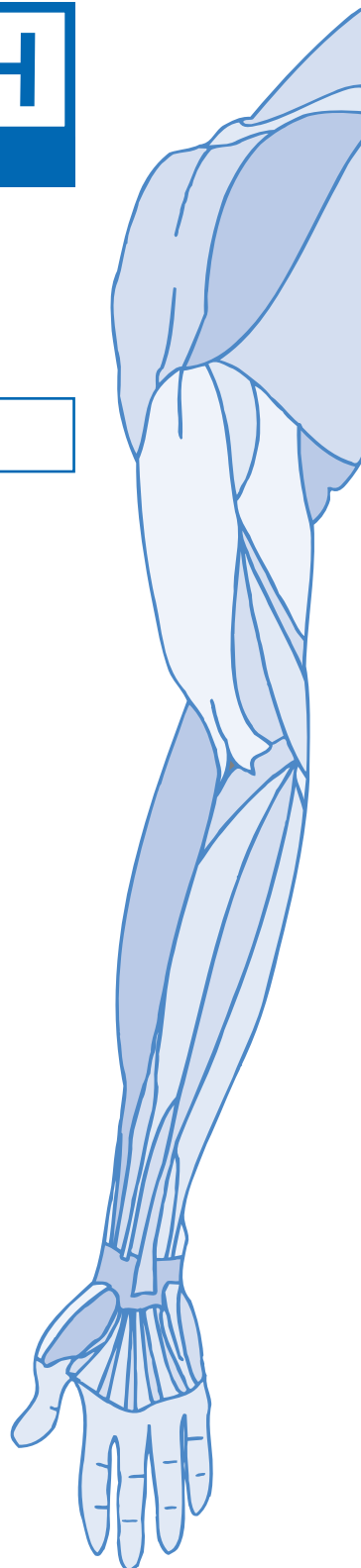**THE**

*Quick*DASH

OUTCOME MEASURE

…a faster way to measure
upper-extremity disability
& symptoms

Information for Users

About the *Quick*DASH

The DASH Outcome Measure has been increasing in popularity since its release in 1996. Today the tool is being used around the world in both clinical and research settings and has proven to be a useful self-report outcome measure for people with musculoskeletal upper-limb disorders.

The *Quick*DASH is a shortened version of the DASH Outcome Measure. Instead of 30 items, the *Quick*DASH uses 11 items to measure physical function and symptoms in persons with any or multiple musculoskeletal disorders of the upper limb. Like the DASH, the *Quick*DASH also has two four-item optional modules that are scored separately.

This shortened version of the tool provides clinicians with an option that enables faster measurement of disability and symptoms; however, there are some advantages to using the full DASH outcome measure. (*See Psychometric Properties*)

The *Quick*DASH Outcome Measure is available free of charge (for non-commercial purposes) and may be downloaded from the DASH web site at www.dash.iwh.on.ca. Information on scoring is also available on-line.

Development of the *Quick*DASH

Statistical analysis of the 30-item DASH indicated that it could be reduced to 11 items while still maintaining an acceptable rating of internal consistency for individual patient evaluation (i.e. Cronbach's alpha ~ 0.90). Shortening the DASH was felt to be an attractive and sensible option provided that psychometric properties could be maintained.

Three techniques were used for item reduction using field-testing data for the full DASH. Three different scales (i.e. *Quick*DASH versions) were produced.

Conceptual Method

The first scale was created by selecting items that represented each of the key domains identified in the theoretical framework of the full DASH. The 16 original domains were reduced to 11 based on similarity across domains. Items in the full DASH were sorted according to the domain they represented and were then ranked according to two criteria: first, the importance and difficulty according to patients, and second, correlation with total DASH score. The highest-ranking items in each of the 11 specified domains were chosen to comprise the concept-based version of the *Quick*DASH.

Equidiscriminative Item-Total Correlation (EITC)

The second scale was created by selecting items that had the highest correlation with overall scores across subgroups (those with high, moderate and low levels of disability). The four items with the highest correlation in each grouping were selected to compose the EITC-based version of the *Quick*DASH (the item with the smallest correlation of the twelve was eliminated).

Item Response Theory (Rasch Analysis)

The third scale was created using Rasch analysis. DASH items were calibrated based on their relative difficulty; misfitting items were eliminated, and an 11-item scale was produced with items theoretically equally spaced and calibrated along the scale length.

Evaluation and Comparison

Three distinct *Quick*DASH versions were produced using the item-reduction techniques described. These scales were evaluated and compared using data from the original 30-item DASH prospective cohort (i.e., 200 individuals with various upper-limb disorders). The final decision of the accepted version of the *Quick*DASH was made based on the following criteria:

- number of items with > 40% in one response category

- Cronbach's alpha > 0.90

- highest correlation with the 30-item DASH and with other markers of physical function and severity of problem.

The three versions were similar, though differing in content. The concept version ranked slightly better than the others, and was chosen and unanimously supported by the Upper Extremity Collaborative Group (the DASH development group) and named the *Quick*DASH Outcome Measure.

Psychometric Properties

Establishing the psychometric properties of any instrument is an ongoing process and is context specific. In other words, with each new population, clinical setting or treatment type, pilot testing of performance in that particular context is recommended. Initial testing has shown the *Quick*DASH to work well in groups of patients (research studies, program evaluation); however, clinicians should be aware that there are advantages to using the full DASH in individual patient monitoring. The precision of measurement is slightly better with the DASH, resulting in greater confidence of the accuracy of scores. Until further data is available on the *Quick*DASH, clinicians should consider this advantage when choosing which measure to use.

	*Quick*DASH	DASH
Reliability		
Internal Consistency	Cronbach's alpha = 0.94	Cronbach's alpha = 0.97
Test-Retest	ICC = 0.94	ICC = 0.96
Validity		
Convergent Construct		
• VAS of overall problem	r = 0.70	r = 0.70
• VAS of overall pain	r = 0.73	r = 0.72
• VAS of ability to function	r = 0.80	r = 0.79
• VAS of ability to work	r = 0.76	r = 0.77
Known-Groups		
• able to do all need to versus limited	$\underline{M}$ = 25.4 vs. 48.6	$\underline{M}$ = 23.6 vs. 47.1
• able to work versus unable to work due to upper-limb problem	$\underline{M}$ = 27.5 vs. 52.6	$\underline{M}$ = 26.8 vs. 47.1
Responsiveness		
• Change in group of patients undergoing treatment; expected to improve	SRM = 0.79	SRM = 0.78
• Change in those rating their problem as better	SRM = 1.03	SRM = 1.05

ICC – intra-class correlation coefficient (2,1)
$\underline{M}$ – average score; r – Pearson product moment correlation
SRM - standardized response mean; VAS - visual analogue scale

All Pearson product moment correlations and known-group differences statistically significant at $p \leq 0.05$.

Scoring the *Quick*DASH

The *Quick*DASH is scored in two components: the disability/symptom section (11 items, scored 1-5) and the optional high performance sport/music or work modules (4 items, scored 1-5).

Disability/Symptom Score

At least 10 of the 11 items must be completed for a score to be calculated. The assigned values for all completed responses are simply summed and averaged, producing a score out of five. This value is then transformed to a score out of 100 by subtracting one and multiplying by 25. This transformation is done to make the score easier to compare to other measures scaled on a 0-100 scale. A higher score indicates greater disability.

$$= \left(\left[\frac{\text{sum of n responses}}{n} \right] - 1 \right) \times 25,$$

where n is equal to the number of completed responses.

Optional Modules (Sport/Music or Work)

There are two optional modules, each consisting of four items. The optional modules are intended for athletes, performing artists and other groups of workers whose jobs require high levels of physical performance. These individuals may be having difficulties only at these high performance levels, which are beyond the scope of the 11-item *Quick*DASH.

The same procedure described for the disability/symptom score is followed to calculate the optional four-item module score. All four questions must be answered in order to calculate the score. For each module, simply add up the assigned values for each response and divide by four (number of items); subtract one and multiply by 25 to obtain a score out of 100.

Missing Items

If more than 10 per cent of the items (that is, more than one item) are left blank by the respondent, you will not be able to calculate a *Quick*DASH disability/symptom score. By this same rule (that is no more than 10 per cent of the items can be left blank), no missing values can be tolerated in the optional modules because each module consists of only four items.

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