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Assessing Upper Extremity Function and Symptoms: Use of the DASH and the Quick DASH

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Introduction

- As therapists, we all experience the push for evidence-based practices.
- The term 'evidence-based practice' is permeating the healthcare industry.
- Clinicians need dependable, quality information from which to base their clinical decisions.

(Law & MacDermid, 2008)

Initial assessment

- The first step in collecting evidence regarding the effectiveness of our treatment methods is the initial assessment.
- The effectiveness of our initial assessment is dependent on the assessment tool.

DASH & QuickDASH

- There are many tools available to measure the upper extremity. For the purposes of this seminar, we will discuss the DASH (Disabilities of the Arm, Shoulder and Hand) and the Quick DASH, as they are standardized with well documented reliability and validity.

DASH & QuickDASH

- Most therapists using the DASH and the Quick DASH identify it as an assessment and an outcome measure (Bohnen, 2011).
- Indicating that it is effective in identifying change over time. This provides evidence that your treatment is effective.
- The Institute for Work and Health identify both assessments (DASH and Quick DASH) as outcomes measures (http://dash.iwh.on.ca/quickdash)

According to the Institute for Work and Health, the producers of the DASH and the Quick DASH, results of initial testing:

	QuickDASH	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	M = 25.4 vs. 48.6	M = 23.6 vs. 47.1
• able to work versus unable to work due to upper-limb problem	M = 27.5 vs. 52.6	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

Chart key

- ICC – intra-class correlation coefficient (2,1)
- 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 $p<0.05$

www.dash.iwh.on.ca/quickdash

Statistics (the boring stuff)

- **Reliability** – repeatability of a measure. Reliability is often measured with Chronbach's alpha test for internal consistency; a measure that demonstrates similar responses among several items measuring a general concept.
- **Validity** – does the test effectively measure what it intends to measure. There are many different types of validity, as demonstrated in the chart.

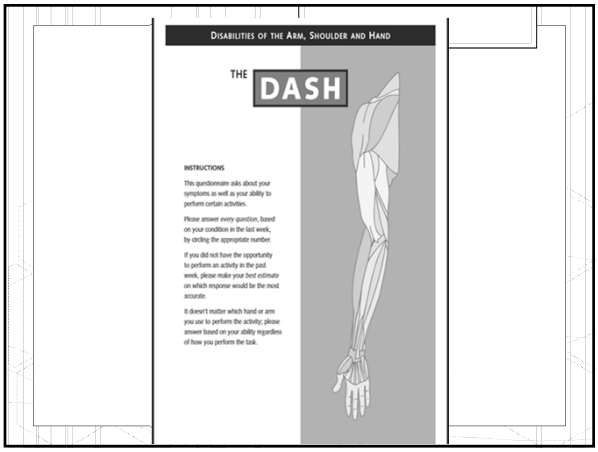
As a general rule, you want to use an assessment where both of these numbers are close to '1'.

More statistics ☺

- **Responsiveness** – change in measure reflects change in condition
- The chart reflects similar psychometric properties in both the DASH and the QuickDASH.

The DASH

- Originally released in 1996
- It is a 30 item assessment used internationally in both clinical and research settings.
- It functions as a reliable and valid self-report outcome measure for patients with musculoskeletal upper extremity disorders.


DISABILITIES OF THE ARM, SHOULDER AND HAND

THE DASH

INSTRUCTIONS

This questionnaire asks about your symptoms as well as your ability to perform certain activities.

Please answer every question, based on your condition in the last week, by circling the appropriate number.

If you did not have the opportunity to perform an activity in the past week, please make your best estimate on which response would be the most accurate.

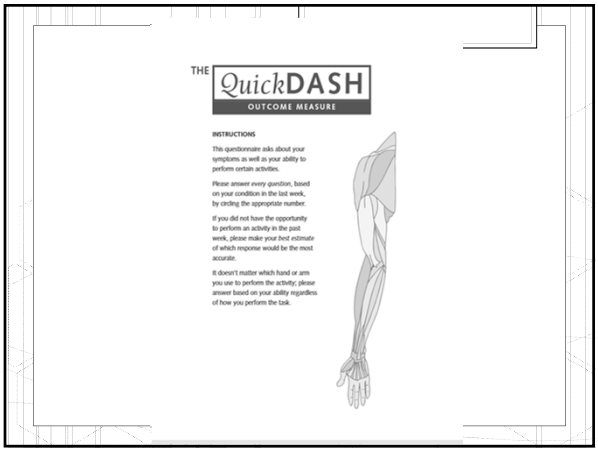
It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.

instructions

- As this is a standardized assessment (the same questions are asked to all participants), the instructions should be as consistent between patients as possible.
- You can use the instructions page as a script while administering to patients. This will ensure optimal intra-rater and inter-rater reliability of test administration.

Review of the DASH

- We will go over the questions during this webinar.
  - http://www.dash.iwh.on.ca/
- Using task analysis, you can see how the questions are designed to identify specific areas of deficit.
- This triggers the therapist to evaluate why the activity is difficult, and the therapist can then develop an effective treatment plan.


THE QuickDASH
OUTCOME MEASURE

INSTRUCTIONS

This questionnaire asks about your symptoms as well as your ability to perform certain activities.

Please answer every question, based on your condition in the last week, by circling the appropriate number.

If you did not have the opportunity to perform an activity in the past week, please make your *best estimate* of which response would be the most accurate.

It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.

instructions

- The instructions provided to the patient for the Quick DASH are identical to those provided for the DASH. Again, stick to the instructions as closely as possible to ensure reliability of test outcomes among and between patients and test administrators.

What items are different on the Quick DASH?

- The optional modules are the same
- There are16 original domains that are represented in the original 30 questions.
- There was enough similarity among the domains to decrease the number of domains to 11.
- The 11 items chosen to be included in the Quick DASH from the full DASH are representative the questions identified by importance and difficulty as reported by patients.
- The correlation with the DASH was determined as well.

DASH & QuickDASH

- Items 1, 7, 10, 14, 16, 18, 22, 23, 24, 26, and 29 are included in the Quick DASH
- AROM, strength, tolerance for ballistic activities, pain, and paresthesias are addressed in both assessments.

Work Module

Addresses these issues as they relate to work:

- activity modification due to UE issue
- pain with activities specific to work
- work quality and sense of self-efficacy regarding work product
- time required for job performance (has it changed?)

Sports/Performing Arts Module

Questions for this module relate to playing a musical instrument, playing sports, or both.

Sports/Performing Arts Module

Addresses the issues of:

- activity modification due to UE issue
- pain with activities specific to playing instrument or sports
- performance quality and sense of self-efficacy regarding ability to play instrument or sport
- time required for practicing or playing instrument or sport, has it changed?

Why use the DASH vs the Quick DASH…or vice versa

- Third party payer may require one measure over others.
- Quick DASH may be useful in detecting different degrees of disability, especially with patients with greater severity of disability (Gummesson, Ward, Atroshi, 2006)
- According to psychometric properties, precision of measurement is slightly better with the DASH, which may make it useful for monitoring individual patients vs groups of patients. (http://www.dash.iwh.on.ca/)

Why use the QuickDASH vs the DASH…or vice versa

- In a busy clinic, the shorter version can be done more quickly.
- Patients who are resistant to filling out healthcare forms are less resistant when the form is short.
- For optimal accuracy in assessing change, use the same instrument used for the initial assessment, regardless which assessment you choose.

Scoring the DASH

Scoring methods were updated in 2002.

- The DASH is scored in two components: the disability/symptom questions (30 items, scored 1-5) and the optional high performance sport/music or work section (4 items, scored 1-5)
- 27 of the 30 items must be completed for accurate scoring
- A higher score indicates greater disability
- http://www.dash.iwh.on.ca/

Scoring the DASH

- First: add up the items and then find the mean by dividing by the total items scored:
- Example:

135 (sum of items)/30 (items completed) = 4.5

(this would change if the patient answered < 30 items)

Scoring the DASH

- Next: plug the numbers into the following formula:
- DASH disability/symptom score = ((sum of n responses/n) – 1)) x 25
- n= # of completed responses

Scoring the DASH

With our example:

- DASH disability/symptom score = (4.5 – 1) x 25 =

3.5 x 25 = **87.5**

This creates a score that is based on a 0-100 score to make comparisons to other measurement scales easier.

Optional Modules

- The purpose of these modules is to detect difficulties that are specific to professional athletes, performers, or other individuals who are experiencing functional deficits that may not be detected by the 30 item DASH

Scoring the DASH - modules

- There are 2 optional modules.
  - Work Module
  - Sports/Performing Arts Module
- Each has 4 items, and all items must be completed for accurate scoring.
- The same scoring technique is used as is used for the 30 item questionnaire, but it is done separately.

Scoring the DASH - modules

- Add up the values for each item
- Divide the total by 4
- To transform to a 100 based scale, subtract 1 from the total and multiply by 25
- DASH Module score =
  ((sum of n responses/n) – 1)) x 25

Scoring the DASH - modules

- DASH Module score =
  15/4 = 3.75

  (3.75– 1) x 25 =

  2.75 x 25 = **68.75**

Scoring the Quick DASH

- There are 11 items in this questionnaire
- If more than 1 item is missing, you cannot score the Quick DASH (at least 10 out of the 11 items must be completed.
- The same 2 optional modules can be used with the Quick DASH, and scoring is the same.
  - Work Module
  - Sports/Performing Arts Module

Scoring the Quick DASH

- The Quick DASH is scored using the same formulas as the DASH, there are just fewer possible responses.
- Example with a score of 42:

sum of n responses (score)/n (number of items)

42 (score)/11 (items)= **3.8**

Scoring the Quick DASH

- now convert to 0-100 scale:

((sum of n responses/n) – 1) x 25
((42/11) -1) x 25
(3.8 – 1) x 25 =
2.8 x 25 = **70**

Which scale should you use?

- Whether or not you complete the score transformation depends on the needs of your organization or patients.
- With either approach you will be able to demonstrate change or lack of change.
- In your clinical assessment this provides evidence for the effectiveness of your treatment....evidence based practice!

Summary

- Both the DASH and the QuickDASH have established validity and reliability that ensures an excellent 'evidence base' on which to base your practice decisions and outcomes measurements.
- For the most part, the assessments are inter-changable, with similar psychometrics.
- Choose the assessment based on the needs and requirements of the patient, your setting, or reimbursement source.

Q & A:

- Questions?
- Comments?
- Concerns?

References

- Bohnen, C. (2011). Outcome measure use in occupational therapy for upper extremity rehabilitation: results of a survey of therapist clinical practices (2011). *Master of Arts in Occupational Therapy Theses.* Paper 1.
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