

The Neck Disability Index



An instrument for measuring self-rated disability due to neck pain or whiplash-associated disorder

Copyright:

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1. Introduction

The Neck Disability Index (NDI) was developed in the late 1980's by Dr. Howard Vernon and first published in the Journal of Manipulative and Physiological Therapeutics in 1991 [1]. The NDI was modelled on a similar instrument for assessing self-rated disability in low back pain patients – the Oswestry Low Back Pain Disability Questionnaire, which had been in existence for about eight years. Dr. Vernon received permission from the developer of the “Oswestry Index” to modify it for use in neck pain patients.

After selecting some of the original items from the Oswestry Index and then developing new items for neck pain patients, the prototype of the NDI was tested on a group of neck pain patients as well as chiropractors. Several modifications were made until a final version was acceptable. This version was then tested for reliability and validity and the results of these tests were published in the 1991 article. When it was published, the NDI became the first instrument for testing self-rated disability in neck pain patients.

Since 1991, a number of other questionnaires for neck pain patients have been developed, but the NDI remains the oldest and most widely used of these instruments [2]. Here are some more details:

- As of mid-2008, over 350 articles in the scientific literature have cited the NDI.
- It has been used in 40 studies related to whiplash injury.
- It has been translated into over 20 languages.
- It has been used in 103 treatment studies, including 43 surgical studies, 57 studies of non-surgical treatments. 46 of these studies have been randomized clinical trials.

2. Primary findings on the NDI:

Vernon's review paper of 2008 [6] is included in this manual and provides specific data from all of the studies of the psychometric properties of the NDI. The following is a summary of these findings:

The NDI has been shown to be highly reliable on what is called "test-retest" reliability [1]. The individual items have been shown to group together well as a single measure of self-rated physical disability [3]. The NDI has also been shown to be valid by comparing NDI scores to other measures of pain and disability [1, 4].

An important finding as published in the late 1990's by Riddle and Stratford [5]. They found that, for patients with scores in the mild-to-moderate range (where most patients score), there was a certain number of NDI points that could be regarded as "minimally important clinical change" by patients. This number is 5 or 10%. So, if your patient first scores 15 out of 50, and then, two weeks later, scores 12, this would not be regarded as a clinically important change. However, if they scored 10 or less, than this would be regarded as a clinically important change.

3. Scoring the NDI:

The NDI consists of 10 items, each with a score up to 5, for a total score of 50. The lower the score, the less self-rated disability. Dr. Vernon established the following guide to interpretation of a patient's score [1]:

- 0 – 4 = No disability
- 5 – 14 = Mild disability
- 15 – 24 = Moderate disability
- 25 – 34 = Severe disability
- 35 or over = Complete disability

4. Item issues:

Users should attempt to have all 10 items completed at all administrations. Some patients may find 1-2 items not applicable to their lives. This is especially true of “driving”. This item may be omitted and the instrument scored out of 45, converted to 100% and then divided by 2.

The other item which may cause some problem is “work”. While the term “work” was meant for any circumstance, many people interpret it as “work at my job”. Therefore, if they are not employed, they may decline to complete this item. In that case, please re-interpret this item as “housework” for anyone not working out of the house.

For missing items not explained above (simple omissions, etc), only up to 2 missed items should be allowed. With 3 or more missed items, the administration would be regarded as unacceptable.

For 1-2 missed items, there are two strategies that amount to the same result:

- take the score out of 45 or 40, convert to 100% and divide by 2
- insert the average item score (total score divided by 9 or 8) into each missing item

5. Using the NDI:

The NDI should be an important part of your first assessment of any patient with neck pain, especially due to trauma. The question arises, “when should I repeat the NDI?” Remember that the NDI measures self-rated disability, not just current pain level. This applies to a person’s ability to perform their daily activities. A single, composite measure of this ability (the NDI score) is not likely to change over a short period of time. So, we recommend that the NDI be used on 2-week intervals over the course of your treatment of a patient with neck pain.

6. Links:

<http://www.proqolid.org/>

http://www.pedro.fhs.usyd.edu.au/CEBP/index_cebp.html

<http://www.worksafe.vic.gov.au>

<http://www.medigraphsoftware.com>

<http://www.painworld.zip.com>

<http://medal.org>

<http://outcomesassessment.org>

<http://www.maa.nsw.gov.au>

http://apa.advsol.com.au/physio_and_health/research/evidence/outcome_measures.cfm

<http://caretrak-outcomes.com>

<http://ccachiro.org>

<http://www.unisa.edu.au/cahe/>

<http://www.tac.vic.gov.au/jsp/content/NavigationController.do?areaID=22&tierID=1&navID=92ACB96A7F000001011DDD0421B6C947&navLink=null&pageID=942>

<http://clinicaltrials.gov/ct/show/NCT00349544;jsessionid=26CC121CFA39CE943448CF75822A8C60?order=1>

<http://www.cks.library.nhs.uk>

7. References:

1. Vernon HT, Mior SA. The Neck Disability Index: a study of reliability and validity. J Manip Physiol Ther 1991;14:409-415.

2. Pietrobon B, Coeytaux RB, Carey TS, Richardson WJ, DeVellis RF. Standard scales for measurement of functional outcome for cervical pain or dysfunction - A systematic review. *Spine* 2002; 27(5):515-522.
3. Hains F, Waalen J, Mior S. Psychometric properties of the neck disability index. *Journal of Manipulative and Physiological Therapeutics* 1998; 21(2):75-80.
4. Vernon H. Assessment of self-rated disability, impairment, and sincerity of effort in whiplash-associated disorder. *Journal of Musculoskeletal Pain* 2000; 8(1-2):155-167.
5. Riddle DL, Stratford PW. Use of generic versus region-specific functional status measures on patients with cervical spine disorders. *Physical Therapy* 1998; 78(9):951-963.
6. Vernon H. The Neck Disability Index: State-of-the-art, 1991-2008. *J Manip Physiol Ther* 2008;31:491-502.

A complete list of all the NDI citations is available from Dr. Vernon at hvernon@cmcc.ca.

Neck Disability Index

THIS QUESTIONNAIRE IS DESIGNED TO HELP US BETTER UNDERSTAND HOW YOUR **NECK PAIN** AFFECTS YOUR ABILITY TO MANAGE EVERYDAY -LIFE ACTIVITIES. PLEASE MARK IN EACH SECTION THE **ONE BOX** THAT APPLIES TO YOU.

ALTHOUGH YOU MAY CONSIDER THAT TWO OF THE STATEMENTS IN ANY ONE SECTION RELATE TO YOU, PLEASE MARK THE BOX THAT **MOST CLOSELY** DESCRIBES YOUR PRESENT -DAY SITUATION.

SECTION 1 - PAIN INTENSITY

- ☐ I have no neck pain at the moment.
- ☐ The pain is very mild at the moment.
- ☐ The pain is moderate at the moment.
- ☐ The pain is fairly severe at the moment.
- ☐ The pain is very severe at the moment.
- ☐ The pain is the worst imaginable at the moment.

SECTION 2 - PERSONAL CARE

- ☐ I can look after myself normally without causing extra neck pain.
- ☐ I can look after myself normally, but it causes extra neck pain.
- ☐ It is painful to look after myself, and I am slow and careful.
- ☐ I need some help but manage most of my personal care.
- ☐ I need help every day in most aspects of self -care.
- ☐ I do not get dressed. I wash with difficulty and stay in bed.

SECTION 3 – LIFTING

- ☐ I can lift heavy weights without causing extra neck pain.
- ☐ I can lift heavy weights, but it gives me extra neck pain.
- ☐ Neck pain prevents me from lifting heavy weights off the floor but I can manage if items are conveniently positioned, ie. on a table.
- ☐ Neck pain prevents me from lifting heavy weights, but I can manage light weights if they are conveniently positioned.
- ☐ I can lift only very light weights.
- ☐ I cannot lift or carry anything at all.

SECTION 4 – READING

- ☐ I can read as much as I want with no neck pain.
- ☐ I can read as much as I want with slight neck pain.
- ☐ I can read as much as I want with moderate neck pain.
- ☐ I can't read as much as I want because of moderate neck pain.
- ☐ I can't read as much as I want because of severe neck pain.
- ☐ I can't read at all.

SECTION 5 – HEADACHES

- ☐ I have no headaches at all.
- ☐ I have slight headaches that come infrequently.
- ☐ I have moderate headaches that come infrequently.
- ☐ I have moderate headaches that come frequently.
- ☐ I have severe headaches that come frequently.
- ☐ I have headaches almost all the time.

SECTION 6 – CONCENTRATION

- ☐ I can concentrate fully without difficulty.
- ☐ I can concentrate fully with slight difficulty.
- ☐ I have a fair degree of difficulty concentrating.
- ☐ I have a lot of difficulty concentrating.
- ☐ I have a great deal of difficulty concentrating.
- ☐ I can't concentrate at all.

SECTION 7 – WORK

- ☐ I can do as much work as I want.
- ☐ I can only do my usual work, but no more.
- ☐ I can do most of my usual work, but no more.
- ☐ I can't do my usual work.
- ☐ I can hardly do any work at all.
- ☐ I can't do any work at all.

SECTION 8 – DRIVING

- ☐ I can drive my car without neck pain.
- ☐ I can drive my car with only slight neck pain.
- ☐ I can drive as long as I want with moderate neck pain.
- ☐ I can't drive as long as I want because of moderate neck pain.
- ☐ I can hardly drive at all because of severe neck pain.
- ☐ I can't drive my car at all because of neck pain.

SECTION 9 – SLEEPING

- ☐ I have no trouble sleeping.
- ☐ My sleep is slightly disturbed for less than 1 hour.
- ☐ My sleep is mildly disturbed for up to 1-2 hours.
- ☐ My sleep is moderately disturbed for up to 2-3 hours.
- ☐ My sleep is greatly disturbed for up to 3-5 hours.
- ☐ My sleep is completely disturbed for up to 5-7 hours.

SECTION 10 – RECREATION

- ☐ I am able to engage in all my recreational activities with no neck pain at all.
- ☐ I am able to engage in all my recreational activities with some neck pain.
- ☐ I am able to engage in most, but not all of my recreational activities because of pain in my neck.
- ☐ I am able to engage in only a few of my recreational activities because of neck pain.
- ☐ I can hardly do recreational activities due to neck pain.
- ☐ I can't do any recreational activities due to neck pain.

PATIENT NAME _____

DATE _____

SCORE _____ [50]

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