

Comment on:

Centralization in patients with sciatica: are pain responses to repeated movement and positioning associated with outcome or types of disc lesions?

Hanne B. Albert • Eva Hauge • Claus Manniche

Eur Spine J, published online 23 September 2011, DOI 10.1007/s00586-011-2018-9

Comment:

Hanne Albert and her colleagues present a secondary analysis of an RCT (Albert and Manniche 2011). The journal SPINE has already accepted this article and will publish it in an upcoming issue. In their primary study, the Danes randomized 181 patients with radiculopathy into two groups. One group received so called „symptom guided exercises“. In this context the authors refer to the MDT method but they don't use the term McKenzie therapy. The examiner at baseline and three of the four treating therapists didn't have a formal MDT training. A Diploma holder in MDT had provided training for the baseline examiner and the treating therapists with emphasis on detection of centralization. Patients in the symptom guided group were additionally instructed in segmental stabilization exercises for the core muscles. The second group received sham exercises. These are exercises, which have no direct effect on the lower back but target on general activation and an increase in systemic blood circulation. Therapists in both groups explained the rationale behind the treatment regime to their patients in a comprehensible way.

Patients in the symptom guided group improved significantly more than the patients doing sham exercises concerning global improvement, leg pain, signs of nerve root compression and sick leave. This was the case after eight weeks and after one year. The difference in the duration of sick leave was a particularly impressive outcome: The patients who had had sick leave in the symptom-guided exercises group had a mean of 73 days (SD 79), and the patients on sick leave in the sham exercises group had had a mean of 107 days (SD 107).

So what are the main statements of this study?

- 1. If leg pain in radiculopathy patients can be changed during a MDT-like clinical examination, these patients have a better prognosis than the ones whose distal pain cannot be changed during such an examination – no matter whether the pain gets better or worse.*

At first glance, this conclusion seems to turn the “exceptional prognostic position” of the centralization phenomenon on its head. But if you're looking at this aspect closely, it can be put into perspective. Only 11 of 176 of the analyzed patients had been initially categorized as peripheralizers. There's no further information on distribution of these 11 patients to the treatment groups. We know that not all centralizers are apparent in the initial assessment, some are identified in subsequent assessment sessions (Werneke et al. 1999, Werneke et al. 2008). Thus, some of these peripheralizers on day 1 may have subsequently become centralizers and so may distort some of the conclusions on prognosis. In light of this, the prevalence of 84,8 % of centralizers is surprising high.

2. The overwhelming majority of patients with a rather high risk for surgery can be treated with advice and a physical therapy intervention – even if only sham exercises are performed.

The primary study (Albert and Manniche 2011) pointed out, that the described patients showed significantly better outcomes in most aspects, if they are treated with symptom guided exercises. Nevertheless also most patients improved who had received a reasonable explanation for their “general exercises” by their treating therapists.

Therapists explained to the patients, that their herniated disc has a good potential for healing. Exercises targeting the affected region of the body would just disturb this self-healing process. They compared the situation with a mosquito bite Which of course usually heals by itself. „...if you scratch it, the itching will become worse and the healing period extended. If you don't scratch the mosquito bite, it will take the time of the natural healing process before it disappears, which is shorter than if you scratch it”. General exercises, increasing the blood circulation, would be more useful.

Asked for their treatment preference, a greater number of the patients thought the sham exercises treatment would be more efficacious for them rather than the symptom-guided exercises treatment. At this point, the Danish research illustrates how essential motivation to stay active and a comprehensible explanation of the treatment approach is.

It surely stands out that the patients in the symptom guided had better outcomes despite them having more faith in the efficacy of the sham exercises (Albert and Manniche 2011).

The MDT-like approach even leveled the nocebo effect.

Letting the high prevalence of centralizers pass without comment, the study confirms the prognostic value of centralization and directional preference concerning surgery (Skytte et al. 2005, Kopp et al. 1986).

3. Most LBP-patients with signs and symptoms of nerve root compression are able to centralize their pain with a very high prevalence rate of 84,8 %.

Unfortunately Albert & Co add a new chapter to the deliberate confusion on centralization. More than ten years ago Mark Werneke already emphasized the importance of a consistent operational definition, to make research on this topic comparable (Werneke et al. 1999). This claim runs like a golden thread through relevant research (Werneke et al. 2008).

If authors would stick by the principle: „ centralization = lasting abolition of the most distal pain”, the end of Babylonian definition errors would be in sight. Only 25 % of the patients in Albert's study fulfill the definite criteria for centralization. The group „centralization instable“ is a confusing addition and makes for a real “wishy-washy” category.

Lene Skytte examined a comparable group of patients with a potential demand for surgery. She found a prevalence of 42 % (Skytte et al. 2005). Therapists in Syktte's study fulfilled an important basic criteria. They were all at least credentialed in MDT. Research on reliability for detection of centralization based constantly on this standard of MDT-education (Razmjou et al. 2000, Kilpikoski et al. 2002, Clare et al. 2005). The main examiner in Albert's study had only a basic training for detection of centralization, but no formal MDT course. When it comes to statistical issues like reliability and prevalence, these facts must not be swept under the carpet.

BUT:

Concerning external validity the lack of clinician MDT qualifications adds an interesting dimension. What's worse than a procedure that can only be used by a minority of clinicians? The results of the Danes should motivate all clinicians, to run a mechanical examination especially on those patients who otherwise would wind up prematurely on the operating table.

4. Also patients with a ruptured annulus can centralize their pain.

About this topic there are two considerations – a simple, short one and a far reaching, longer one.

The short answer:

The majority of Albert's „centralizers“ didn't really belong to this diagnostic category (see 3.) and MRI is not an appropriate tool to judge the competency of the annulus. (Weiner and Patel 2008, Lurie et al. 2009, Donelson et al. 1997).

The longer answer:

If a barometer ascends, you are usually expecting nice weather. A barometer doesn't tell us the current temperature. If it's summer and currently 25 degrees Celsius warm, a hot day may be approaching. The barometer is a tool that supports us venturing a prognosis but it doesn't tell us about temperature, sunshine or wind speed. For that you'll need a thermometer, visual control or a wind gauge.

Just like the barometer, the centralization phenomenon fails, if you are misusing it.

Albert's work brings up a painful subject. But the wound is cut by the MDT method itself. The undisputed strength of the MDT classification is the rejection of a structure based diagnosis.

Mechanical categorization by standardized history taking and repeated end-range test movements results in a patient specific treatment program. Rather than generating hypotheses about pain causing structures, MDT forces individual self-treatment. Terms like Directional Preference and Centralization help to define „movement in the right direction“. Its' prognostic (Long 1995, Werneke and Hart 2001, Werneke and May 2005, George et al. 2005) and therapeutic value (Long et al. 2004, Browder et al. 2007, Petersen et al. 2011) are in the meantime well-investigated.

Although Robin McKenzie's idea behind Derangement and Centralization has always been the disc model, he emphasized from the beginning, that classification and treatment always depends on the patient and not on the structure (McKenzie 1981).

Protagonists of the McKenzie System always walked on thin ice when they pushed the analogy derangement = disc and centralization = intact annulus. Ron Donelson fed the disc-advocates when he postulated 1997, that centralization of symptoms needs an intact annulus (Donelson et al. 1997). Nikolai Bogduk criticized immediately Donelson's conclusion and questioned with his recalculation the ability of the centralization phenomenon to answer the question: protrusion or prolapse? (Bogduk N and Lord S 1997). This critique fell on deaf ears in the context of euphoria for Donelson's findings. Stubborn adherence for the patho-anatomic aspect in the framework of a non-structural classification provided an easy target for critics. Doris Broetz from Germany picked up the dominance of the disc in the MDT concept and made a one to one translation of MRI findings to derangement diagnoses (Broetz et al. 2003, Broetz et al. 2008, Broetz et al. 2010,).

Her conclusion; even patients with a ruptured disc can centralize.

Although she diminished the MDT-concept inadequately to the treatment of discs instead of patients, her thoughts find a basis in the definition of the „irreducible derangement“.

With this category, everything seems to be different. „Irreducible derangement“ seems to equal the medical diagnosis of herniated disc.

The strength of MDT is the rejection of diagnosis by structure in the context of musculoskeletal problems. To classify means, defining the most effective treatment.

The concept of Directional Preference and Centralization is so convincing that many researchers have adopted this in their classification systems (Delitto et al. 1995, Fritz et al. 2007, Murphy and Hurwitz 2011a, Murphy and Hurwitz 2011b).

Maybe it's time to decide.

Do we as MDT clinicians claim the ability to diagnose discogenic pain and hope that research will prove in the not so distinct future „derangement = disc pathology“?

or

Do we leave derangement as a mechanical diagnosis and use centralization and directional preference to individually determine the most effective treatment?

References:

Albert, Hanne B.; Manniche, Claus (2011): The efficacy of systematic active conservative treatment for patients with severe sciatica. In: *Spine*, S. 1.

Bogduk N and Lord S (1997): A prospective study of centralisation of lumbar and referred pain: a predictor of symptomatic discs and annular competence: commentary. In: *Pain Medicine Journal Club* 3, S. 246–248.

Broetz, D.; Burkard, S.; Weller, M. (2010): A prospective study of mechanical physiotherapy for lumbar disk prolapse: five year follow-up and final report. In: *NeuroRehabilitation* 26 (2), S. 155–158.

Broetz, D.; Kueker, W.; Maschke, E.; Wick, W.; Dichgans, J.; Weller, M. (2003): A prospective trial of mechanical physiotherapy for lumbar disk prolapse. In: *Journal of Neurology* 250 (6), S. 746–749.

Broetz, Doris; Hahn, Ulrich; Maschke, Evelin; Wick, Wolfgang; Kueker, Wilhelm; Weller, Michael (2008): Lumbar disk prolapse: response to mechanical physiotherapy in the absence of changes in magnetic resonance imaging. Report of 11 cases. In: *NeuroRehabilitation* 23 (3), S. 289–294.

Browder, DavidA; Childs, JohnD; Cleland, JoshuaA; Fritz, JulieM (2007): Effectiveness of an extension-oriented treatment approach in a subgroup of subjects with low back pain: a randomized clinical trial. In: *Phys Ther* 87 (12), S. 1608-18; discussion 1577-9.

Clare, HelenA; Adams, Roger; Maher, ChristopherG (2005): Reliability of McKenzie classification of patients with cervical or lumbar pain. In: *J Manipulative Physiol Ther* 28 (2), S. 122–127.

Delitto, A.; Erhard, R. E.; Bowling, R. W. (1995): A treatment-based classification approach to low back syndrome: identifying and staging patients for conservative treatment. In: *Phys Ther* 75 (6), S. 470-85; discussion 485-9.

Donelson, R.; Aprill, C.; Medcalf, R.; Grant, W. (1997): A prospective study of centralization of lumbar and referred pain. A predictor of symptomatic discs and annular competence. In: *Spine* 22 (10), S. 1115–1122.

Fritz, JulieM; Cleland, JoshuaA; Childs, JohnD (2007): Subgrouping patients with low back pain: evolution of a classification approach to physical therapy. In: *J Orthop Sports Phys Ther* 37 (6), S. 290–302.

George, StevenZ; Bialosky, JoelE; Donald, DouglasA (2005): The centralization phenomenon and fear-avoidance beliefs as prognostic factors for acute low back pain: a preliminary investigation involving patients classified for specific exercise. In: *J Orthop Sports Phys Ther* 35 (9), S. 580–588.

Kilpikoski, Sinikka; Airaksinen, Olavi; Kankaanpaa, Markku; Leminen, Paivi; Videman, Tapio; Alen, Markku (2002): Interexaminer reliability of low back pain assessment using the McKenzie method. In: *Spine (Phila Pa 1976)* 27 (8), S. E207-14.

Kopp, J. R.; Alexander, A. H.; Turocy, R. H.; Levrini, M. G.; Lichtman, D. M. (1986): The use of lumbar extension in the evaluation and treatment of patients with acute herniated nucleus pulposus. A preliminary report. In: *Clin Orthop Relat Res* (202), S. 211–218.

Long, A. L. (1995): The centralization phenomenon. Its usefulness as a predictor or outcome in conservative treatment of chronic low back pain (a pilot study). In: *Spine (Phila Pa 1976)* 20 (23), S. 2513-20; discussion 2521.

Long, Audrey; Donelson, Ron; Fung, Tak (2004): Does it matter which exercise? A randomized control trial of exercise for low back pain. In: *Spine (Phila Pa 1976)* 29 (23), S. 2593–2602.

Lurie, JonD; Doman, DavidM; Spratt, KevinF; Tosteson, AnnaNA; Weinstein, JamesN (2009): Magnetic resonance imaging interpretation in patients with symptomatic lumbar spine disc herniations: comparison of clinician and radiologist readings. In: *Spine (Phila Pa 1976)* 34 (7), S. 701–705.

McKenzie, R.A (1981): The lumbar spine. Mechanical diagnosis and therapy : volume 1. Waikanae: Spinal publications.

Murphy, Donald R.; Hurwitz, Eric L. (2011a): Application of a diagnosis-based clinical decision guide in patients with low back pain. In: *Chiropr Man Therap* 19 (1), S. 26.

Murphy, Donald R.; Hurwitz, Eric L. (2011b): Application of a diagnosis-based clinical decision guide in patients with neck pain. In: *Chiropr Man Therap* 19 (1), S. 19.

Petersen, Tom; Larsen, Kristian; Nordsteen, Jan; Olsen, Steen; Fournier, Gilles; Jacobsen, Soren (2011): The McKenzie Method Compared With Manipulation When Used Adjunctive to Information and Advice in Low Back Pain Patients Presenting With Centralization or Peripheralization: A Randomized Controlled Trial. In: *Spine (Phila Pa 1976)* 36 (24), S. 1999–2010.

Razmjou, H.; Kramer, J. F.; Yamada, R. (2000): Intertester reliability of the McKenzie evaluation in assessing patients with mechanical low-back pain. In: *J Orthop Sports Phys Ther* 30 (7), S. 368-83; discussion 384-9.

Skytte, Lene; May, Stephen; Petersen, Peter (2005): Centralization: its prognostic value in patients with referred symptoms and sciatica. In: *Spine (Phila Pa 1976)* 30 (11), S. E293-9.

Weiner, Bradley K.; Patel, Rikin (2008): The accuracy of MRI in the detection of Lumbar Disc Containment. In: *J Orthop Surg Res* 3 (1), S. 46.

Werneke, M.; Hart, D. L. (2001): Centralization phenomenon as a prognostic factor for chronic low back pain and disability. In: *Spine (Phila Pa 1976)* 26 (7), S. 758-64; discussion 765.

Werneke, M.; Hart, D. L.; Cook, D. (1999): A descriptive study of the centralization phenomenon. A prospective analysis. In: *Spine (Phila Pa 1976)* 24 (7), S. 676–683.

Werneke, Mark W.; Hart, Dennis L.; Resnik, Linda; Stratford, Paul W.; Reyes, Adrian (2008): Centralization: prevalence and effect on treatment outcomes using a standardized operational definition and measurement method. In: *J Orthop Sports Phys Ther* 38 (3), S. 116–125.

Werneke, Mark; May, Stephen (2005): The centralization phenomenon and fear-avoidance beliefs as prognostic factors for acute low back pain. In: *J Orthop Sports Phys Ther* 35 (12), S. 844-5; author reply 845-7.