



DBC Method and Evidence



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The DBC treatment is applicable for most lumbar and cervical disorders. It is based on the principles of evidence-based medicine and is supported by scientific research and extensive clinical experience. The clinical results are exceptionally good. The effectiveness of the treatment is maintained through systematic monitoring of quality. The latest international treatment guidelines provide strong support for the DBC approach. DBC treatment provides superior cost-effectiveness compared to the more traditional methods of physiotherapy.

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Most key opinion leaders today consider spine disorders as multifactorial, bio-psycho-social problems: prolonged pain tends to develop into a combination of physical, psychological and social disabilities, potentially leading to absence from work and early retirement. The traditional approach to look for a single, explicit reason (diagnosis) for musculoskeletal disorders is challenging with most spinal patients. ‘Abnormal’ findings in the spine in MRI or CT imaging are almost as frequent among back-healthy controls as among back patients. Likewise, there are severely disabled back and neck pain sufferers among whom we cannot find structural abnormalities regardless of the level of advancement in the diagnostic tools.

We may take another view into the consequences of prolonged pain. Regardless of its origin, pain disturbs both voluntary and non-voluntary movement control, and induces fears. This may lead to cumulative microtrauma, overloading, muscle fatigue, and avoidance behaviour. The subsequent outcome is a vicious circle with gradually decreasing physical condition and more pain and suffering. Moreover, numerous ‘psychological’ factors are involved in mediating the relationships between physical impairment, pain and disability. Fear-avoidance beliefs about work and physical activity, catastrophising, the lack of belief in one’s own ability to manage pain, cope and function, and self-efficacy beliefs are all significantly related with disability in chronic pain patients. In other words, instead of a single ‘injury’, most chronic spinal patients suffer from a combination of functional (physical and/or psychological) problems.

The DBC Method

The new scientific knowledge on the functional problems has been implemented to a clinical application in the DBC treatment method, where the aim is to deal with the functional problems with functional restoration. The term functional restoration means the combination of physical and behavioural (psychological) interventions in the rehabilitation.

The DBC functional restoration program aims at:

- Restoring the range of motion
- Restoring muscle co-ordination and movement control
- Improving muscle endurance
- Improving general condition
- Re-educating patients in the difference between normal physical loading and pain
- Reducing fears and avoidance behaviour
- Tackling the psychological/social/occupational obstacles of return-to-work

DBC functional restoration includes systematic quantification of both the physical function and psychological factors. These findings ‘drive’ the therapeutic process. The baseline assessment yields a bio-psychosocial profile of the patient. The profile is used in the design of an individual treatment program and in assessing prognostic factors. Initial parameter levels are monitored later for indications to progress.

The individualized treatment program combines specific exercises with cognitive-behavioural modification. The exercises progress gradually and are carried out under close supervision of trained staff. The cognitive-behavioural support includes individual training and “learning by doing”. Towards the end of the program, a home exercise program is introduced for maintaining the results.

The monitoring of outcomes provides information on the progress and outcome of the treatments. It enables timely adjustments of the treatment program and forms the basis for long-term follow-up. Additionally, the monitoring of outcomes makes it possible to operate a quality assurance system for clinical outcomes. All DBC clinics provide their treatment results data into the centralised database in an anonymous manner for quality assurance purposes. The accumulated data is also used for research and development purposes.

Evidence

Evidence-based medicine (EBM) is an approach that promotes the integration of valid and applicable clinical and research-derived evidence. The best available evidence, moderated by individual patient circumstances and preferences, is applied to improve the quality of clinical judgments. The DBC treatment method has been built on the EBM principles. The findings form a vast number of studies concerning the epidemiology, etiology and pathophysiology of spinal disorders and efficacy studies and systematic reviews on the treatment outcomes have been taken into account while designing the DBC treatment contents. Moreover, continuous monitoring of effectiveness through quality assurance, i.e., the ongoing analysis of treatment outcomes in DBC clinics, makes it possible to secure real-life effectiveness of the DBC treatment.

Following the principles of EBM, the efficacy of a therapeutic procedure is proven in tightly controlled studies, in which well-described diagnostic and inclusion criteria are applied and well-trained professionals provide carefully standardized interventions. These studies are typically carried out by research institutes and universities. Specially selected subjects go through an “informed consent” procedure. Those who fulfil the strict inclusion criteria and volunteer for randomization to different treatment options are included in the study. Often patients who doubt some of the interventions or providers do not volunteer. Therefore, the study populations may not be representative of the real patients with complex symptoms. Due to e.g. these reasons, the true effectiveness of the interventions that are shown efficacious in randomized trials needs to be confirmed in “real-life” settings in clinical practice.

Systematic reviews (SR) can help practitioners stay updated of the medical literature by summarizing large bodies of efficacy studies and explaining differences among studies on the same question. As the review process is subject to bias, like any other type of research, a systematic review requires precise methods and clear reporting of the original information. This is a clear difference in comparison to the traditional ‘narrative’ reviews, which are merely expert opinions, based on selected ‘suitable’ studies. SRs are scientific investigations in themselves, with a set of original studies as their study objects. They sum up the results of multiple primary investigations, preferably randomized controlled trials, by using strategies that limit bias and random

error. These strategies include a comprehensive search of all potentially relevant articles and the use of precise, reproducible criteria in the selection of articles for review. Primary research designs and methods are evaluated, data are summarized, and results are interpreted. Several SRs concerning the efficacy of treatments for low back and neck disorders have been published in recent years.

Systematic reviews

Systematic reviews of medical research on chronic spinal pain indicate clearly that functional restoration (the combination of physical and behavioural/psychological interventions) is effective not only in reducing pain and disability, but also in reducing the number of absence days from work (Tables 1 and 2).

Along these lines, also the latest European Guidelines for the Management of Chronic Non-Specific Low Back Pain (COST B13 Working Group: http://www.back-paineurope.org/web/files/WG3_Guidelines.pdf) ends up in the following conclusions: “Cognitive behavioural therapy, supervised exercise therapy, brief educational interventions, and multidisciplinary (bio-psycho-social) treatment can each be recommended for non-specific CLBP. Back schools (for short-term improvement), and short courses of manipulation/mobilisation can also be considered.

The use of physical therapies (heat/cold, traction, laser, ultrasound, short wave, interferential, massage, corsets) cannot be recommended. We do not recommend TENS.”

It is noteworthy that the DBC treatment combines elements from most of the interventions that have been shown effective in systematic review, but does not include non-effective items.

Evidence For	Source
<i>Functional Restoration</i>	<i>Schonstein E, et al. Work conditioning, work hardening and functional restoration for workers with back and neck pain. Cochrane Database of Systematic Reviews 2003, Issue 3.</i>
<i>Exercise therapy</i>	<i>Hayden JA, et al. Exercise therapy for treatment of non-specific low back pain. Cochrane Database of Systematic Reviews 2005, Issue 3.</i>
<i>Behavioural treatment</i>	<i>Ostelo RWJG, et al. Behavioural treatment for chronic low-back pain. Cochrane Database of Systematic Reviews 2005, Issue 1.</i>
<i>Back schools in occupational setting</i>	<i>Heymans MW, et al. Back schools for non-specific low-back pain. Cochrane Database of Systematic Reviews 2004, Issue 4.</i>
<i>Multidisciplinary rehabilitation for subacute LBP</i>	<i>Karjalainen K, et al. Multidisciplinary biopsychosocial rehabilitation for subacute low-back pain among working age adults. Cochrane Database of Systematic Reviews 2003, Issue 2.</i>
<i>Massage when combined with exercise and education</i>	<i>Furlan AD, et al. Massage for low-back pain. Cochrane Database of Systematic Reviews 2002, Issue 2.</i>
Insufficient or no evidence	Source
<i>Transcutaneous electrical nerve stimulation (TENS)</i>	<i>Khadilkar A, et al. Transcutaneous electrical nerve stimulation (TENS) for chronic low-back pain. Cochrane Database of Systematic Reviews 2005, Issue 3.</i>
<i>Low level laser therapy</i>	<i>Yousefi-Nooraie R, et al. Low level laser therapy for nonspecific low-back pain. Cochrane Database of Systematic Reviews 2007, Issue 2.</i>
<i>Traction</i>	<i>Clarke JA, et al. Traction for low-back pain with or without sciatica. Cochrane Database of Systematic Reviews 2007, Issue 2.</i>
<i>Manual material handling advice and assistive devices</i>	<i>Martimo KP, et al. Manual material handling advice and assistive devices for preventing and treating back pain in workers. Cochrane Database of Systematic Reviews 2007, Issue 3.</i>

Table 1. Systematic reviews on the efficacy of conservative interventions for chronic low back disorders as of the latest update of Cochrane Database of Systematic Reviews (2007, Issue 3).

<i>Evidence For</i>	<i>Source</i>
<i>Exercise</i>	<i>Kay TM, et al. Exercises for mechanical neck disorders. Cochrane Database of Systematic Reviews 2005, Issue 3.</i>
<i>Multimodal care (Mobilisation combined with Exercises)</i>	<i>Gross AR, et al. Manipulation and mobilisation for mechanical neck disorders. Cochrane Database of Systematic Reviews 2004, Issue 1.</i>
<i>Insufficient or no evidence</i>	<i>Source</i>
<i>Multidisciplinary rehabilitation</i>	<i>Karjalainen K, et al. Multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults. Cochrane Database of Systematic Reviews 2003, Issue 2.</i>
<i>Massage</i>	<i>Haraldsson BG, et al. Massage for mechanical neck disorders. Cochrane Database of Systematic Reviews 2006, Issue 3.</i>
<i>Electrotherapy</i>	<i>Kroeling P, et al. Electrotherapy for neck disorders. Cochrane Database of Systematic Reviews 2005, Issue 2.</i>
<i>Ergonomic interventions for work-related pain</i>	<i>Verhagen AP, et al. Ergonomic and physiotherapeutic interventions for treating work-related complaints of the arm, neck or shoulder in adults. Cochrane Database of Systematic Reviews 2006, Issue 3.</i>

Table 2. Systematic reviews on the efficacy of conservative interventions for chronic neck disorders as of the latest update of Cochrane Database of Systematic Reviews (2007, Issue 3).

Efficacy studies with DBC

The efficacy of DBC treatments specifically has been tested in clinical trials (Table 3). The results clearly indicated that the DBC treatment was effective in reduction of pain and physical impairment, improvement of psychological well-being, and improved mobility and muscle endurance and strength.

Effectiveness of DBC treatment

Tens of thousands patients have already been treated within the DBC network of caregivers all over the world without complications. Subgroup analyses indicate that patients with different types of back or neck problems obtain clinically important benefits from the DBC treatment. Some 85% of patients report reduction in pain during the treatment and more than 90% satisfaction with care. The results last over time. Recurrences of significant back pain and absenteeism are rare, especially if the patients remain active after the DBC treatment.

Figure 1 shows the DBC treatment results on pain in almost 60 thousand treated patients with low back

pain. The results are categorised by the type of lumbar disorder and indicate that, irrespective of the underlying type of disorder, the DBC treatment provides over 50% reduction of pain on the average.

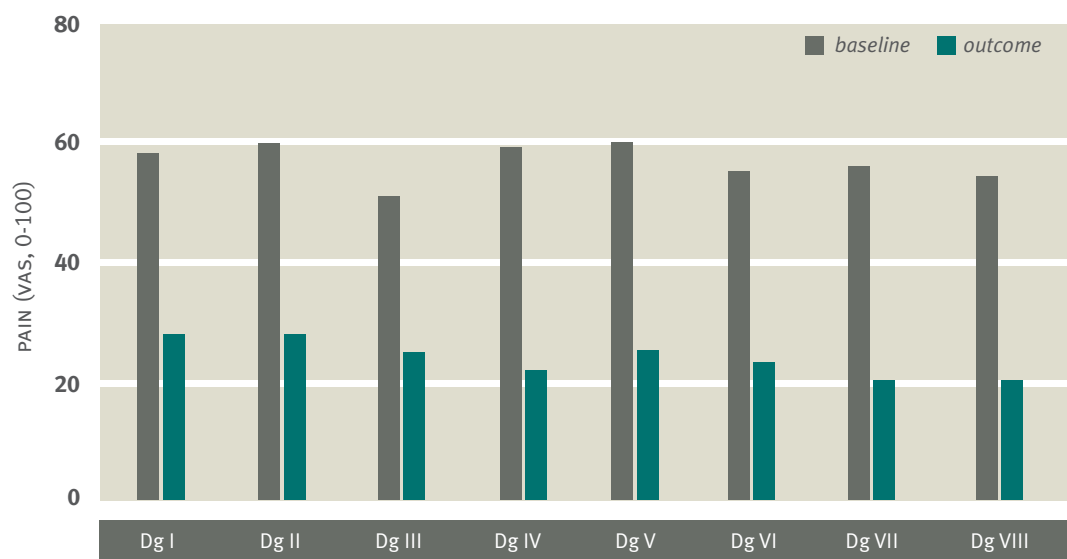
Figure 2 shows the DBC treatment results on pain in over 10 thousand treated patients with neck pain. The results are categorised by the type of cervical disorder and indicate that, irrespective of the underlying type of disorder, the DBC treatment provides over 50% reduction of pain on the average.

Summary of the effectiveness concerning DBC treatment

Systematic reviews and latest practice guidelines provide strong evidence for the approach chosen by DBC. Efficacy studies (RCTs, long-term follow-ups) and the quality assurance data, over 70 thousand treated patients, provide exceptional evidence for the DBC treatment efficacy. DBC treatment provides outcomes superior to traditional physiotherapy methods. Since the costs of DBC treatment are comparable to other forms of physiotherapy, but the outcomes are superior, DBC treatment provides superior cost-effectiveness.

<i>Trial</i>	<i>Source</i>
<i>Effectiveness of DBC treatment in Italy</i>	<i>Taimela S, et al. Functional rehabilitation of low back disorders. Eura Medicophys. 2004 Mar;40(1):29-36.</i>
<i>Long-term follow-up of DBC results</i>	<i>Taimela S, et al. The role of physical exercise and inactivity in pain recurrence and absenteeism from work after active outpatient rehabilitation for recurrent or chronic low back pain: a follow-up study. Spine. 2000 Jul 15;25(14):1809-16.</i>
<i>Randomised trial of DBC efficacy on low back disorders</i>	<i>Kankaanpää M, et al. The efficacy of active rehabilitation in chronic low back pain. Effect on pain intensity, self-experienced disability, and lumbar fatigability. Spine. 1999 May 15;24(10):1034-42.</i>
<i>Randomised trial of DBC efficacy on neck disorders</i>	<i>Taimela S, Takala EP, Asklof T, Seppala K, Parviainen S. Active treatment of chronic neck pain: a prospective randomized intervention. Spine. 2000 Apr 15;25(8):1021-7.</i>
<i>Cohort study on DBC effectiveness on low back disorders</i>	<i>Taimela S, Härköpää K. Strength, mobility, their changes, and pain reduction in active functional restoration for chronic low back disorders. J Spinal Disord. 1996 Aug;9(4):306-12.</i>

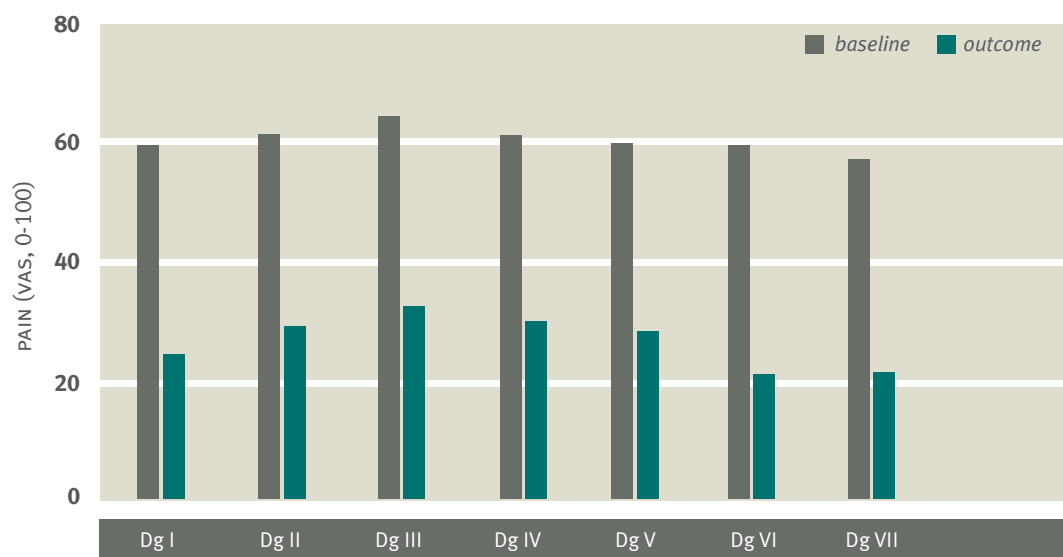
Table 3. Efficacy studies on DBC treatment in peer-reviewed medical journals.



n = 59 846

I = Inflammatory, *II* = Post-traumatic, *III* = Postoperative, *IV* = Nerve root compression, *V* = Stenosis, *VI* = Pelvic and LBP, *VII* = Spondylolisthesis and -lysis, *VIII* = Non-specific pain

Figure 1. The effectiveness of the DBC treatment on low back pain in 59 846 treated patients.



n = 10 402

I = Inflammatory, *II* = Post-traumatic, *III* = WAD, *IV* = Postoperative, *V* = Stenosis, *VI* = Nerve root compression, *VII* = Non-specific pain

Figure 2. The effectiveness of the DBC treatment on neck back pain in 10 402 treated patients.

