

Multidisciplinary Rehabilitation and Climatotherapy for Chronic Diseases at the Dead Sea

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Abstract

Introduction: Since 2004, the DMZ Medical Center and the Norwegian Rehabilitation Center are providing multidisciplinary and comprehensive program for patients suffering from various chronic conditions, mostly musculoskeletal diseases and Chronic Fatigue Syndrome (CFS). The Center has developed a unique concept, based on a multidisciplinary rehabilitation model associated to the intense use of climatic factors present in this area, offering so a good alternative for Norwegian patients. The multidisciplinary rehabilitation Climatotherapy (MDR-C) at the Dead Sea fit the needs of a true MDR program, while introducing a new dimension in this field.

Methods: This 3-week long multidimensional rehabilitation at the Dead Sea is a full-time behavioral medical program administered in a cognitive out-patient setting which follows the evidence-based guidelines for therapeutic interventions. At the Dead Sea, medical and psychiatric co-morbidities are carefully taken into account when tailoring the therapeutic plan for each patient. As well the nature and severity of symptoms, together with the individual's level of function and psychosocial stressors of each participant are initially evaluated, before and during the treatment. Several psychological, cognitive and psychosocial interventions are included in this MDR-C program, resulting in a very compact and powerful multi-modal cognitive behavioral agenda.

Results and Conclusion: Of more of thousand patients treated, a huge amount of them showed significant improvement in their condition and quality of life parameters after treatment at the Dead Sea, describing their stay as a turning point in their disease history and in their life. In a large proportion, they were able to resume work, education or studies. Norwegian physicians are now referring in increasing numbers chronically ill patients to this intensive rehabilitation program.

Key words: Multidisciplinary Rehabilitation, Climatotherapy, Musculoskeletal Diseases, Cognitive Behavioral Therapy, Dead Sea.

Rehabilitación multidisciplinar y Climatoterapia para enfermedades crónicas en el Mar Muerto

Resumen

Introducción: Desde 2004, EL Centro Médico DMZ y el Centro de Rehabilitación noruego están proporcionando un programa amplio y multidisciplinar para los pacientes que sufren diversas enfermedades crónicas, en su mayoría enfermedades músculo-esqueléticas y Síndrome de Fatiga Crónica (SFC). El Centro ha desarrollado un concepto único, basado en un modelo de rehabilitación multidisciplinar asociado al uso intensivo de los factores climáticos presentes en esta área, ofreciendo así una buena alternativa para los pacientes noruegos. La Rehabilitación Climatoterapia multidisciplinar (MDR-C) en el Mar Muerto satisface las necesidades de un verdadero programa MDR, al tiempo que introduce una nueva dimensión en este campo.

Métodos: Se trata de 3 semanas de rehabilitación multidimensional en el Mar Muerto en un programa a tiempo completo de medicina del comportamiento que debe administrarse con un conocimiento de los pacientes que sigue las directrices basadas en la evidencia para las intervenciones terapéuticas. En el Mar Muerto, la situación médica y psiquiátrica se tienen cuidadosamente en cuenta a la hora de adaptar el plan terapéutico de cada paciente. Además de la naturaleza y gravedad de los síntomas, se evalúan inicialmente el nivel de funcionalidad y los factores estresantes psicosociales de cada participante, antes y durante del tratamiento. Varias intervenciones psicológicas, cognitivas y psicosociales se incluyen en este programa de la MDR-C, dando como resultado una agenda muy compacta y un potente programa multimodal de conocimiento de la conducta.

Resultados y Conclusión: De los más de mil pacientes tratados, una gran cantidad de ellos mostraron una mejoría significativa en su estado y en los parámetros de calidad de vida después del tratamiento en el Mar Muerto, describiendo su estancia como un punto de inflexión en la historia de su enfermedad y en su vida. En una gran proporción, fueron capaces de reanudar el trabajo, la educación o los estudios. Los médicos noruegos hacen ahora referencia al aumento del número de pacientes con enfermedades crónicas que siguen este programa intensivo de rehabilitación.

Palabras clave: Rehabilitación Multidisciplinar, Climatoterapia, Enfermedades Musculo-esqueléticas, Terapia del Comportamiento Cognitivo, Mar Muerto.

REFERENCE STANDARD

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THE NORWEGIAN REHABILITATION CENTER, DØDEHAVSKLINIKKEN

The Norwegian Dead Sea Clinic was established on idealistic principles in 2004 as a private institution, in close collaboration with Medical Institutions and Univer-

sities in Norway. The clinic was already recognised in 2005 by the Norwegian Governmental Institution, Rikstrygdeverket, due to its unique treatment program and the collaboration with the reputed international specialist team at the DMZ Medical Center. The DMZ is located in the Lot Spa Hotel on the seashore of the southern part of the Dead Sea. During the three-week program, the Norwegian patients are accommodated in the Hotel, together with the specialist team of nurses, physiotherapist and physicians from Norway. The Norwegian Rehabilitation Center is providing multidisciplinary and comprehensive rehabilitation for patients suffering from different chronic diseases, like musculoskeletal disorders, chronic fatigue syndrome (CFS/ME), skin disorders and lung diseases.

THE MULTIDISCIPLINARY REHABILITATION AND CLIMATOTHERAPY (MDR-C): THE CONCEPT

Chronic diseases are complex conditions, in which psychological distress combined with somatic and psychosocial challenges often makes it difficult to return to working life. These conditions call for multidisciplinary and holistic treatment and rehabilitation.

Very few rehabilitation centers are able to reach the level at which several treatment modalities are incorporated simultaneously during therapy. For example, "Comprehensive rehabilitation" in Norway includes indeed a lot of options, but lacks by the fact that it can be resumed to physical and group activities. Although social interventions take place in the treatment, they are not always considered as a tool for reaching a primary endpoint. Finally, psychological and psychiatric interventions are used only in specialized settings and rarely a part of a rehabilitation program.

Co-morbid psychiatric diseases and psychological distress are well known among patients suffering from chronic diseases. At the Dead Sea medical and psychiatric co-morbidities as well as the nature and severity of symptom domain, together with the individual's level of function and psychosocial stressors, are carefully taken into account when tailoring the rehabilitation program for each patient.

The Norwegian Dead Sea Clinic has developed a unique concept, based on a **multidisciplinary rehabilitation model associated to the intense use of climatic factors** and offers multidisciplinary rehabilitation for Norwegian patients with different chronic diseases during a three-week stay¹. The multidisciplinary rehabilitation Climatotherapy (MDR-C) at the Dead Sea fit the needs of a true MDR program, whilst introducing a new vision of MDR in a unique climate.

The treatment is multidisciplinary and individually tailored to suit each individual's complex needs. Safeguard or improvement of physical and mental health, as well as successful psychosocial interventions is the main challenge of the program.

During the stay, therapists working as a team on each patient tend to improve quality of life issues by helping to find ways to cope with everyday stress, whilst addressing the challenge of living with a chronic disease. The rehabilitation issues, always meeting high quality standards, look after the patient's needs and expectations, in an overall perspective.

Patients treated at the Dead Sea Clinic belong to four main categories of diseases, while other diseases are treated only sporadically:

- ✓ Musculoskeletal disorders, such as inflammatory joint diseases, Osteoarthritis, Fibromyalgia and Chronic Pain Syndrome.
- ✓ Chronic Fatigue Syndrome or Myalgic Encephalomyelitis.
- ✓ Skin diseases like Psoriasis, Atopic Dermatitis, Vitiligo, Mycosis Fungoides.
- ✓ Respiratory diseases such as COPD, Asthma, Cystic Fibrosis.

Dead Sea Climatotherapy is world-wide known as one of the best treatment modality for many chronic diseases, without serious side effects for the patients and with only a few contraindications²⁻³⁻⁴⁻⁵⁻⁶⁻⁷⁻⁸.

MDR-C: THE PROGRAM

The treatment approach derives from a holistic, bio-psycho-social understanding of chronic diseases. This 3-week long multidimensional rehabilitation program at the Dead Sea is a full-time behavioral medicine program in a cognitive setting. The program is based on classical multimodal rehabilitation and evidence-based rehabilitation treatment methods and provided in a quiet and relaxing atmosphere in an out-patient-setting.

Cognitive behavioural therapy has a well-documented key role in multidisciplinary models of rehabilitation. Psycho-educational rehabilitation treatment, building on cognitive techniques, includes both psycho-education and stress and pain management (individually and in groups), in addition to psychosocial activities. By becoming aware of the complex interplay between various factors that intensify and sustain their disease, patients are able to acquire better coping strategies. Physical rehabilitation treatment employs graduated, individualized training, physiotherapy and hydrotherapy. Physical activities are calibrated and tailored to the individual's condition and capacity. Parallel instruction in relaxation techniques and body consciousness enables the individual patient to find an optimal balance between rest and activity. Resilience training focuses on self-mastery in order to strengthen the healing powers of the body and the mind. A health-promoting diet and lifestyle is emphasized through instruction and individual guidance.

Patients with chronic diseases often suffer from reduced sleep quality and disrupted circadian rhythms. Instruction and individualized sleep hygiene advice are essential for many of these patients. A schedule with a structured, predictable

timetable for the day is an important tool for regulating circadian rhythm. Patients are issued with an instruction pamphlet which describes the principles of rehabilitation treatment; many of them also find it useful to keep a diary.

Medical climatotherapy was shown to increase the effect of rehabilitation treatment modalities⁹.

Climatotherapy

The term “Dead Sea Climatotherapy” includes several medically supervised treatment modalities: heliotherapy (sun exposure), balneotherapy and pelotherapy, hydrotherapy, physiotherapy, sport and physical training, with the optimal use of unique climatic factors. Through these scientifically well-recognized treatment methods, the patients receive an individual medical Climatotherapy protocol as an integral part of the custom made multidisciplinary rehabilitation program.

Cognitive Behavioural Therapy

Cognitive behavioural therapy, CBT is a psychotherapeutic approach that aims to influence dysfunctional emotions, behaviors and cognitions through a goal-oriented, systematic procedure. Many CBT treatment programs for specific disorders have been developed and evaluated for efficacy and effectiveness; the health-care trend of evidence-based treatment, where specific treatments for specific symptom-based diagnoses are recommended, has favored CBT over other approaches.

The particular therapeutic techniques are chosen according to the particular kind of problem issues. In CBT the individual identify and monitor thoughts, assumptions, beliefs and behaviors that are related and accompanied to debilitating negative emotions and to identify those which are dysfunctional, inaccurate or simply unhelpful. This is done in an effort to replace or transcend them with more realistic and useful ones, paving the way for new ways of behaving and reacting.

Cognitive competence training program enable strategies for coping the daily challenges of chronic afflictions, pain and stress. The behavioral therapies include relaxation, breathing and biofeedback techniques, together with mindfulness based stress reduction. Both ability to self-regulate subjective states and confidence resulting from successful mastery through behavioral therapy, seem to be of prime importance in the recovery process.

The psychological, cognitive and psychosocial interventions in the MDR-C program are all included in the multi-modal cognitive behavioral treatment model.

The multi-modal Cognitive Behavioral Treatment model

The multi-modal cognitive treatment model (M-CBT) includes graduated physical exercises, psychological interventions, including cognitive and behavioral modification, psycho-educational program and psychosocial intervention and support. The physical training is programmed in supervised group exercise interventions, both indoors and outdoors, including relaxation and stress coping strategies. The behavioral therapies include relaxation, breathing and biofeedback techniques, together with mindfulness based stress reduction. The education program includes lectures and small group sessions on health promoting issues, as nutrition, sleep hygiene, physical activity, psychological factors, communication and stress coping strategies.

The psycho-educational program and CBT, involving cognitive and behavioral therapy, are given in individual therapy as well as in group settings. Groups are an important modality because of the dynamic developing between the participants. Intense and focused psychological interventions take naturally place in the group, which participants experience many hours together with their pairs. Regular meetings, including seminars, lectures and presentations, are programmed almost every day during the 3-week stay. The program addresses the complexity of social, behavioral and psychosocial issues, helping the individual to regain control of their symptoms and their life, in order to promote positive change in quality of life.

The Personal at the Norwegian Clinic

The Norwegian multidisciplinary treatment team, consisting of a psychiatrist, a psychotherapist, specialized nurses and a physiotherapist, cooperates with the multidisciplinary team at the DMZ Medical Center. Specialists from the fields of internal medicine, pulmonology, rheumatology, dermatology and family medicine are represented. Specialists in neurology, orthopaedics and physical medicine are also affiliated with the clinic. The Norwegian team have accommodations in the same building as the patients, ensuring maximum accessibility and follow-up. Active patient participation throughout the entire stay is essential. The Rehabilitation program “builds health” by focusing on the individual’s resources and opportunities for continued positive development after returning home.

The international specialist team performs initial evaluations of each patient and includes the patient in the decision-making process, prescribing a graded therapeutic procedure. During the 3 weeks, this program is further adjusted the individual’s special needs. An individual plan is set up for each patient. The patients follow their individual scheduled program, under supervision and regular evaluation of the multidisciplinary team of physicians, nurses and physiotherapist.

EXPERIENCES AT THE DEAD SEA

Spectacular Improvement

The patients have significant improvement of their condition after treatment at the Dead Sea Clinic, describing the stay as a turning point in their disease and life situation. The majority of them also have positive long-term effects. These include reduced symptoms, disability and psychological distress, improved circadian rhythm and quality of sleep, improved daily functioning and social activities, improved family relations and quality of life. They also consume less medical care and use fewer drugs such as sedative and analgesics. In a large proportion, patients are able to resume work, education or studies.

Auto-immune diseases

At the Dead Sea many studies show that the diseases treated successfully and with long term effects at the Dead Sea, are all connected to autoimmunity. The unique climatic factors at the Dead Sea, including the special ratio of UVA and UVB radiation coming from the sun, may induce a modulating effect on the immune system, through the vitamin D metabolism. Moreover, changes in the endocrine system, affecting the HPA-axis and the stress response might be induced by the extraordinary combination of climatic factors incorporated in the daily treatment protocols of the patients.

Vitamin D levels

CFS patients also suffer from arthralgia and myalgia, and it is to be expected that they may experience a similar effect. Furthermore, it is shown that CFS patients often have deficiency in vitamin D (Berkovitz et al¹⁰). Interestingly, it was recently shown in a study of Norwegian patients suffering from various rheumatic diseases that a three-week stay at the Dead Sea induced significant changes in vitamin D levels, and that the increased 25-OH-D3 serum levels were associated with reduced musculoskeletal pain and disease severity (Harari et al⁹).

CFS at the Dead Sea

1. Many CFS patients have reported significant improvement of their condition after treatment at the Dead Sea Clinic, many of them also with positive long-term effects. Back home they continue to practice what they achieved during the stay, such as relaxation techniques, graduated exercise program and cognitive coping strategies. In a large proportion, patients are able to resume work, education or studies.

2. There are several possible explanations for this positive effect of rehabilitation of CFS patients at the Dead Sea. For chronic inflammatory conditions, such as rheumatoid arthritis, it was shown that when the rehabilitation takes place in a warm climate, the results of the ordinary rehabilitation activities are improved, since the climate initially reduces pain, making the patients more able to participate in group activities, physical exercise, and so on (Forseth¹¹).
3. A small retrospective observational study (Harari et al¹²) inform about a possible successful treatment for CFS at the Dead Sea. No conclusions can be drawn from these preliminary results, even if there are very impressive. *The preliminary findings of the long term follow up study (7 years), show that 60% of the patients strongly agree with the statement that their treatment stay at the Dead Sea Clinic was a turning point in their lives and induced a positive change in their disease and in their overall life situation. 88% are back to their daily and social activities and 65% "RTW", resume work or school/education relatively short time after their rehabilitation stay at the Dead Sea.*

So far the results are based on Patient Reported Outcomes ("PRO"), patients' narratives and simple evaluation forms only. These outcomes are essential in most chronic diseases, which usually are nonfatal, and consequently positioning survival and recurrence rates as no longer sufficient evaluation tools (Nijsten et al¹³). Causing no permanent physical damage, these medical conditions cannot usually be measured using serological markers. However, in these last years much has been done in order to find such indicators, for patients suffering with CFS/ME, especially in the immune system (Brenu EW et al¹⁴).

4. The future: CFS Study - Oslo University and DMZ Medical Center, the Dead Sea MDR-C at the Dead Sea is actively examined as a valuable therapeutic option for patients suffering from CFS. In collaboration with Oslo University Hospital, The DMZ Medical Center and The Norwegian Rehabilitation Center are now planning a well-designed prospective randomized controlled and single blinded study on a 3-year period. Here are the outlines of this project:

Chronic fatigue syndrome (CFS) / Myalgic Encephalomyelitis (ME) still represents a challenge for many scientists and a complex and puzzling condition for clinicians. The Norwegian authorities have recently launched the activities of a reference and research center for CFS/ME at the Oslo University, including a national registry for these patients. The best therapeutic option appears to be a multidisciplinary rehabilitation (MDR), including graded exercise training (GET) and cognitive behavioral therapy (CBT). However very few publications demonstrate a significant improvement in the Quality of Life of the sufferers, and almost none of them dealt with the

parameter "return to work" (RTW) or to school, which is critical for an objective evaluation of the treatment. These last years, good preliminary results are reported from the MDR program given to the patients at the Dead Sea, under unique climatic conditions.

Continuity and teamwork

The prevalence of musculoskeletal disorders is higher in Norway than in many other European countries; such disorders are the primary cause of disability. Strong analgesics are the most common "rehabilitation treatment" for chronic pain, due to a lack of effective rehabilitation programmes. Chronic diseases are complex conditions which pose great challenges and require multidisciplinary and holistic assessment and rehabilitation that is tailored to the needs of the individual. Early access to rehabilitation services is essential for a successful result. Prevention, treatment and rehabilitation must go hand in hand. This requires teamwork, with the general practitioner as the key coordinator and the patient as an active participant in the rehabilitation process. Close cooperation with physicians and others working in this field in Norway is crucial for achieving good long-term results after rehabilitation at the Dead Sea. For many who are chronically ill, their stay at the Dead Sea Clinic is a significant turning point in the development of their disease and in their lives, enabling them to return to Norway with an improved level of physical and psychological well-being, renewed hope and new coping strategies for living with chronic disease.

CONCLUSION

The Norwegian Rehabilitation Center, Dødehavsklinikken, at the Dead Sea is providing multidisciplinary and comprehensive rehabilitation for patients with various chronic diseases. The Clinic is located at the DMZ Medical Center, at the Lot Spa Hotel, Ein Bokek, Israel. Dead Sea Medical Climatotherapy is an integrated therapeutic modality in this program which increases the rates of positive outcomes and allows long-term improvement in quality of life parameters. In a large proportion, patients are able to resume work, education or studies. Norwegian physicians are referring chronically ill patients, in increasing numbers, to this three-week intensive rehabilitation program.

REFERENCES

1. Harari M, Dramsdahl E. Multidisciplinary rehabilitation at the Dead Sea. Norway Medical Association. *Indremedisineren* 2011 Jun; 39-41.
2. Kushelevsky AP, Harari M, Kudish AI, Hristakieva E, Ingber A, Shani J. Safety of solar phototherapy at the Dead Sea. *J Am Acad Dermatol* 1998; 38: 447-52.
3. Moses SW, David M, Goldhammer E, Tal A, Sukenik S. The Dead Sea, a unique natural health resort. *Isr Med Assoc J.* 2006 Jul;8(7):483-8.
4. Ingber A. Medicine is Flourishing at the Dead Sea. *Isr Med Assoc J.* 2006 Jul;8(7):499-500.
5. Sukenik S, Abu-Shakra M, Kudish S, Flusser D. Dead Sea and Tiberias as health resort areas for patients suffering from different types of arthritis. *Harefuah.* 2006 Feb; 145(2):117-22, 165.
6. Sherman G, Zeller L, Avriel A, Friger M, Harari M and Sukenik S. Intermittent Balneotherapy at the Dead Sea Area for Patients with Knee Osteoarthritis. *Isr Med Assoc J.* 2009 February: vol 12: 88-93.
7. Sukenik S, Flusser D, Codish S, Abu-Shakra M. The Dead Sea - a unique resort for patients with rheumatic diseases. *Harefuah.* 2010 Mar; 149(3):175-9,193.
8. Prins JB, van der Meer JW, Bleijenberg G. Chronic fatigue syndrome. *Lancet.* 2006 Jan 28;367(9507):346-55.
9. Harari M, Dramsdahl E, Shany S, Baumfeld Y, Ingber A, Novack V, Sukenik S. Increased vitamin D serum levels correlate with clinical improvement of rheumatic diseases after Dead Sea climatotherapy. *Isr Med Assoc J.* 2011 Apr;13(4):212-5.
10. Berkovitz S, Ambler G, Jenkins M, Thurgood S. Serum 25-hydroxy vitamin D levels in chronic fatigue syndrome: a retrospective survey. *Int J Vitam Nutr Res.* 2009 Jul;79(4):250-4.
11. Forseth KØ. [Treatment of rheumatic patients in a warm climate abroad]. *Tidsskr Nor Laegeforen.* 2007 Feb 15;127(4):449-52.
12. Harari M, Dreier J, Czarnowicki T, Ruzicka T, Ingber A. SCORAD 75: a new metric for assessing treatment outcomes in atopic dermatitis. *J Eur Acad Dermatol Venereol.* 2011 Nov 10. doi: 10.1111/j.1468-3083.2011.04331.x.
13. Nijsten T, Sampogna F, Stern RS, Abeni D. The reduced Impact of Psoriasis Questionnaire has good psychometric properties in Italian patients. *Dermatology.* 2007;215(4):348-51.
14. Brenu EW, Staines DR, Baskurt OK, Ashton KJ, Ramos SB, Christy RM, Marshall-Gradisnik SM. Immune and hemorheological changes in chronic fatigue syndrome. *J Transl Med.* 2010 Jan 11;8:1.

Relevant articles

- Buskila D, Abu-Shakra M, Neumann L, Odes L, Shneider E, Flusser D, Sukenik S. Balneotherapy for fibromyalgia at the Dead Sea. *Rheumatol Int.* 2001 Apr;20(3):105-8.
- Codish S, Dobrovinsky S, Abu Shakra M, Flusser D, Sukenik S. Spa therapy for ankylosing spondylitis at the Dead Sea. *Isr Med Assoc J.* 2005 Jul;7(7):443-6.
- de Ridder D, Geenen R, Kuijer R, van Middendorp H. Psychological adjustment to chronic disease. *Lancet.* 2008 Jul 19;372(9634):246-55.
- Goldbart AD, Cohen AD, Weitzman D, Tal A. Effects of rehabilitation winter camps at the Dead Sea on European cystic fibrosis patients. *Isr Med Assoc J.* 2007 Nov;9(11):806-9.
- Karagülle Z, Dönmez A. Balneotherapy for fibromyalgia at the Dead Sea. *Rheumatol Int.* 2002 Mar;21(5):210-1.
- Katz U, Shoenfeld Y, Zakin V, Sherer Y, Sukenik S. Scientific Evidence of the Therapeutic Effects of Dead Sea Treatments: A Systematic Review. *Semin Arthritis Rheum.* 2012 Apr 11. doi:10.1016/j.semarthrit.2012.02.006
- Lillefjell M, Krokstad S, Espnes GA. Prediction of function in daily life following multidisciplinary rehabilitation for individuals with chronic musculoskeletal pain; a prospective study. *BMC Musculoskelet Disord.* 2007 Jul 10;8:65.
- Neumann L, Sukenik S, Bolotin A, Abu-Shakra M, Amir M, Flusser D, Buskila D. The effect of balneotherapy at the Dead Sea on the quality of life of patients with fibromyalgia syndrome. *Clin Rheumatol.* 2001;20(1):15-9.
- Sherman G, Zeller L, Avriel A, Friger M, Harari M, Sukenik S. Intermittent balneotherapy at the Dead Sea area for patients with knee osteoarthritis. *Isr Med Assoc J.* 2009 Feb;11(2):88-93.
- Sukenik S, Flusser D, Codish S, Abu-Shakra M. Balneotherapy at the Dead Sea area for knee osteoarthritis. *Isr Med Assoc J.* 1999 Oct;1(2):83-5.
- Sukenik S, Baradin R, Codish S, Neumann L, Flusser D, Abu-Shakra M, Buskila D. Balneotherapy at the Dead Sea area for patients with psoriatic arthritis and concomitant fibromyalgia. *Isr Med Assoc J.* 2001 Feb;3(2):147-50.
- Sukenik S, Abu-Shakra M, Kudish S, Flusser D. [Dead Sea and Tiberias as health resort areas for patients suffering from different types of arthritis]. *Harefuah.* 2006 Feb;145(2):117-22.
- Wigers SH, Finset A. [Rehabilitation of chronic myofascial pain disorders]. *Tidsskr Nor Laegeforen.* 2007 Mar 1;127(5):604-8.

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