



Personal data

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Education

1975	Natural Science mathematical baccalaureate, Kalundborg Gymnasium
Summer 1982	Medical University graduate, Copenhagen University
Dec. 1985	Permission to independently practice medicine
Winter 1988	Law Degree, Copenhagen University
1. dec. 1994	Specialist doctor in rheumatology
1. jun. 1995	Dr. med., Medical Sciences Faculty, Copenhagen University

Employment

1. January 1998 - 31. Aug. 2012	Chief consultant, professor, SpineCenter of Southern Denmark. University of Southern Denmark
1. Sept. 2012 -	Consultant, professor, SpineCenter of Southern Denmark, Sygehus Lillebælt, University of Southern Denmark

Specific organizational tasks

Danish Rheumatology Society. Member of the Board 1992 – 96. Elected as Treasurer 1992 -1995.
Initiator of the research group: The Back science's support association, Copenhagen Environs 1990. The name was later changed to Copenhagen Back Research Association (COBRA). In this group was COBRA database 1 developed and implemented.
Participated in a working group that prepared a Clarification Report: The Future Treatment of patients with lower back disorders in DK. Issued by DADL in 1996.
Initiator and Chairman of the multidisciplinary steering committee that developed and tried implementation of the clinical database: Dansk DiscusBase with a view to a systematic registration of treatment results by herniated operations. 1996 - 2005.
Was appointed by the National Board of Health to function as head of the interdisciplinary working group which drafted: back pain. Prevalence, treatment and prevention from an MTV-perspective. National Institute for Health Technology Assessment. 1995 - 1999.
Appointed by the Minister of Health as a member of a specialist committee in a prevention foundation. 2007 - 2012.
Has participated in an interdisciplinary working group which drafted: Patient Program for the back science in Region of Southern Denmark. 2008 – 2010.

Important contributions to the professional development in the field of Back pain science

Developed in 1984 a new pain measurement tool (the low back pain rating scale) and a new clinical research design for RCT's which contributed to a greater appreciation of the importance of patient-reported data. This data may represent important and efficient outcome parameters, contrary to the objective data. Around that time nobody else valued the patient-reported information. To test the new research methods I conducted a RCT in chronic back pain patients comparing intensive exercises with light exercises or no exercises. Originally published in 1988 in *The Lancet* and the long-term results in PAIN; the results showed clinically important and statistically significant effects of intensive exercises and showed - surprising many of my research colleagues - that it WAS possible to conduct RCT's in patient groups like this. Part of the process was to develop and integrate clinical databases in the area of back pain all over Denmark. I was the founder of the research group: The Back science's support association, Copenhagen Environs 1990. As part of this group I helped to develop and implement the COBRA database, and later, in 2007-2016 the SpineData database.
In 1994 I began the professional and organizational development of the Disc-outpatient clinic in the Orthopaedic Hospital in Aarhus. The outpatient clinic received, opposite the previously time-honored principles in the field, all patients with acute disc herniation for examination and investigation in outpatient settings and the diagnosis was based on interdisciplinary principles. This radical change in treatment policy earned the clinic the Quality Award in 1996 as best public institution in Aarhus.
Following on from this I was appointed as professor and developer of the new Back Center in Funen in 1998, which later became the Back Center of Southern Denmark in 2010. Since 1997, the principles behind "The Learning Organization" were incorporated as a part of the interdisciplinary outpatient concept.

The newest research

Since 2002, I have supported and contributed to research about modic changes at the Back Center in Funen (later Back Center of Southern Denmark). A new area of research from which results have the potential to become, over the next decade, one of the greatest achievements in the back pain area - in relation to improved quality of life for patients with persistent back pain. The research team wanted to replicate the findings of Stirling *et al.* from *The Lancet* in 2001 and demonstrate the presence of bacteria in the discs of patients with back pain. This would then allow to investigate the treatment of low back pain following a disc herniation, in this case related to a type 1 Modic change, using antibiotics. Succeeded in finding bacteria in the discs of patients, in most cases *Propionibacterium acnes* was found, and we successfully demonstrated the use of antibiotics as an effective treatment for back pain. In ongoing research I'm trying to determine the prognostic factors that indicate a patient will develop chronic low back pain. Type 1 Modic change seems to be one of the most powerful prognostic factor in chronic low back pain.
Right now I am running 2 epidemiological and 2 RCT's involving thousands of chronic low back pain patients. Focus is trauma and Post Traumatic Stress Disorders and longterm use of Morphine analogues as analgesics. Data will gather different pieces of information (in respect of the bio-psychosocial domains) from every patient through a several years period. As treatment form I test the effectiveness of psychological interventions combined with classical exercise therapy.

Supervision, lectures and textbooks

Has supervised 12 PhD students and has taught at a large number of postgraduate professional courses and other training courses, especially for rheumatologists, orthopedic surgeons, physiotherapists and chiropractors. Since 1998 partly responsible for the clinical training component of the biomechanics students graduate study at the University of Southern Denmark. Also since 1998 taught medical students at SDU in the topic back diseases. He has been chief editor of the Danish rheumatologists' textbook: "Reumatologi" in the years 1994 - 1990, since co-editor. Has contributed with technical content in a number of Danish textbooks and patient handbooks, eg.: Rygsmerter. Myter og kendsgerninger, 1996 - 98; Reumatologi - en lærebog, 1999 - ; Rygdoktor, 1999 - 2005; Medicinsk kompendium, 2000 -; Smarter - en lærebog, 2002 - ; Patientvejledningen, 2002 -; Praktisk Medicin, 2009 -

Honors and Awards

Recipient of the Danish Society for Manual Medicine Honorary Award, 1989; Hvirvelsøjleprisen; Recipient of the Danish Chiropractors' Association Researcher Prize, 1991; Recipient of Scand Journal of Rheumatology's 40 Nordic Anniversary Prize, 1995; On behalf of Back outpatient-clinic Aarhus County Hospital receives the "Quality Award for the year 1996, Aarhus Amt;" On behalf of Back Center Fyn recipient of the Danish Chiropractors' Association honorary award, 2008.

Internationally indexed 121 articles (h-index = 39; i10-index = 75)**Publications with highest Citation Index:**

- Manniche C, Malchow-Møller A, Andersen JR, Pedersen C, Hansen TM, Jess P, Helleberg L, Rasmussen SN, Tage-Jensen U, Nielsen SE. Randomised study of the influence of non-steroidal anti-inflammatory drugs on the treatment of peptic ulcer in patients with rheumatic disease. *Gut*. 1987; 28: 226-9.
- Manniche C, Hesselsøe G, Bentzen L, Christensen I, Lundberg E. Clinical trial of intensive muscle training for chronic low back pain. *Lancet*. 1988; 2(8626-8627): 1473-6.
- Manniche C, Skall HF, Braendholt L, Christensen BH, Christophersen L, Ellegaard B, Heilbuth A, Ingerslev M, Jørgensen OE, Larsen E, et al. Postoperative dynamic back exercises after first lumbar discectomy. *Spine (Phila Pa 1976)*. 1993; 18: 92-7.
- Manniche C, Asmussen K, Lauritsen B, Vinterberg H, Karbo H, Abildstrup S, Fischer-Nielsen K, Krebs R, Ibsen K. Intensive dynamic back exercises with or without hyperextension in chronic back pain after surgery for lumbar disc protrusion. A clinical trial. *Spine (Phila Pa 1976)*. 1993; 18: 560-7.
- Manniche C, Asmussen K, Lauritsen B, Vinterberg H, Kreiner S, Jordan A. Low Back Pain Rating scale: validation of a tool for assessment of low back pain. *Pain* 1994; 57: 317-26.
- Hestbaek L, Leboeuf-Yde C, Manniche C. Low back pain: what is the long-term course? A review of studies of general patient populations. *Eur Spine J*. 2003; 12: 149-65.
- Albert HB, Manniche C. Modic changes following lumbar disc herniation. *Eur Spine J*. 2007; 16: 977-82.
- Albert HB, Kjaer P, Jensen TS, Sorensen JS, Bendix T, Manniche C. Modic changes, possible causes and relation to low back pain. *Med Hypotheses* 2008; 70: 361-8.
- O'Neill S, Manniche C, Graven-Nielsen T, Arendt-Nielsen L. Generalized deep-tissue hyperalgesia in patients with chronic low-back pain. *Eur J Pain*. 2007; 11: 415-20.
- Albert HB, Sorensen JS, Christensen BS, Manniche C. Antibiotic treatment in patients with chronic low back pain and vertebral bone edema (Modic type 1 changes): a double-blind randomized clinical controlled trial of efficacy. *Eur Spine J*. 2013; 22: 667-707.

Publications 2016

- Bendix T, Manniche C. [Mechanism of low-back pain with focus on Modic changes]. *Ugeskr Laeger* 2016; 178: 856-859.
- Arnbak B, Jensen TS, Egund N, Zejden A, Hørslev-Petersen K, Manniche C, Jurik AG. Prevalence of degenerative and spondyloarthritis-related magnetic resonance imaging findings in the spine and sacroiliac joints in patients with persistent low back pain. *Eur Radiol* 2016; : 26: 1191-2003.
- Arnbak B, Hendricks O, Hørslev-Petersen K, Jurik AG, Pedersen SJ, Østergaard M, Hermansen LT, Loft AG, Jensen TS, Manniche C. The discriminative value of inflammatory back pain in patients with persistent low back pain. *Scand J Rheumatol* 2016; 45: 321-328.
- Arnbak B, Grethe Jurik A, Hørslev-Petersen K, Hendricks O, Hermansen LT, Loft AG, Østergaard M, Pedersen SJ, Zejden A, Egund N, Holst R, Manniche C, Jensen TS. Associations Between Spondyloarthritis Features and Magnetic Resonance Imaging Findings: A Cross-Sectional Analysis of 1,020 Patients With Persistent Low Back Pain. *Arthritis Rheumatol* 2016; 68: 892-900.
- Manniche C, Kiertzner L, Morsoe L. Vertebral Endplate Changes / Modic Changes: An Audit Study Using Antibiotics in 147 Chronic Low Back Pain Patients. *Global Spine Journal* 2016; 06(S 01): DOI: 10.1055/s-0036-1582898.
- Manniche C, Jordan A. 10 years of research: from ignoring Modic changes to considerations regarding treatment and prevention of low-grade disc infections. *Future Sci. OA* 2016; FSO117.
- Manniche C, Jordan A, Mikkelsen C. Back pain and Modic. *London* 2016; 1-106.
- Ris I, Juul-Kristensen B, Boyle E, Kongsted A, Manniche C, Søgaard K. Chronic neck pain patients with traumatic or non-traumatic onset: Differences in characteristics. A cross-sectional study. *Scandinavian Journal of Pain* 01/2017; 14.
- Arnbak B, Jensen RK, Manniche C, Hendricks O, Kent P, Jurik AG, Jensen TS. Identification of subgroups of inflammatory and degenerative MRI findings in the spine and sacroiliac joints: A latent class analysis of 1037 patients with persistent low back pain. *Arthritis research & therapy* 12/2016; 18(1). DOI:10.1186/s13075-016-1131-x.
- Christiansen AA, Hendricks O, Kuettel D, Hørslev-Petersen K, Jurik AG, Nielsen S, Rufibach K, Loft AG, Pedersen SJ, Hermansen LT, Østergaard M, Arnbak B, Manniche C, Weber U. Limited Reliability of Radiographic Assessment of Sacroiliac Joints in Patients with Suspected Early Spondyloarthritis. *The Journal of Rheumatology* 10/2016; DOI:10.3899/jrheum.160079.