

# **Person-centred prehabilitation program to improve functioning In patients with severe low back pain planned for lumbar fusion surgery**

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i sal 2118, Hälsovetarbacken, Arvid Wallgrens Backe, hus 2, plan 1, fredagen den 18 januari, klockan 13.00

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## **Avhandlingen baseras på följande delarbeten**

- I. Lotzke H, Gutke A, den Hollander M, Smeets R, Lundberg M. Developing an evidence-based prehabilitation programme designed to improve functional outcomes after lumbar fusion surgery – A feasibility study using the Medical Research Council framework. *European Journal of Physiotherapy*. Accepted
- II. Lotzke H, Jakobsson M, Brisby H, Gutke A, Hägg O, Smeets R, den Hollander M, Olsson L-E, Lundberg, M. Use of the PREPARE (PREhabilitation, Physical Activity and exeRcisE) program to improve outcomes after lumbar fusion surgery for severe low back pain: a study protocol of a person-centred randomised controlled trial. *BMC Musculoskelet Disord*. 2016;17(1):349
- III. Lotzke H, Jakobsson M, Gutke A, Hagströmer M, Brisby H, Hägg O, Smeets R, Lundberg M. Patients with severe low back pain exhibit a low level of physical activity before lumbar fusion surgery: a cross-sectional study. *BMC Musculoskelet Disord*. 2018; 19(1):365
- IV. Lotzke H, Brisby H, Gutke A, Hägg O, Jakobsson M, Smeets R, Lundberg M. A Person-Centered Prehabilitation Program Based on Cognitive-Behavioral Physical Therapy for Patients Scheduled for Lumbar Fusion Surgery – A Randomized Controlled Trial. Submitted

**SAHLGRENKA AKADEMIN  
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



# **Person-centred prehabilitation program to improve functioning In patients with severe low back pain planned for lumbar fusion surgery**

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## **Abstract**

**Introduction:** Low back pain is a frequently reported symptom and has turned into a global problem. For people with severe chronic low back pain, spinal fusion surgery can be a treatment option. The outcome of fusion surgery is not always successful and some patients report having a low quality of life after surgery. The overall purpose of this thesis was to develop and evaluate a prehabilitation programme for patients scheduled for lumbar fusion surgery. In addition, the aim was to investigate the pre-surgical level of physical activity in this group.

**Material and methods:** In Study I, a person-centred prehabilitation programme was developed in several steps and tested in a single case study design. In Study II, the theoretical framework and the treatment manual for the active intervention were described in detail in the format of a study protocol. In Study III the physical activity level of 118 patients planned for surgery due to degenerative disc disease was investigated objectively in a cross-sectional study. An association between factors in the fear-avoidance model and physical activity were investigated. In Study IV the effect of the prehabilitation programme was evaluated in a randomised controlled trial comparing the active intervention to conventional care. A linear mixed model was used to evaluate the outcome measures at six months after lumbar fusion surgery.

**Results:** The theoretical framework and the treatment manual of the prehabilitation programme were adjusted after the single case study (Study I). The revised study design was published in a study protocol (Study II). Only 17% of the study group fulfilled the WHO recommendations of physical activity for health benefits. The variable “steps per day” was found to be associated with both fear of movement and disability (Study III). No statistically significant differences between groups were seen in the primary outcome disability from baseline to six months (Study IV). Among secondary outcome measures, a statistically-significant interaction effect was seen for EQ-5D index with the largest between-group difference seen one week prior to surgery in favour of the active intervention. Both groups reached the minimal important change for the primary outcome, and many of the secondary outcomes already at 8 weeks follow-up.

**Conclusion:** These findings, indicate that patients planned for lumbar fusion surgery have low physical activity level and are thereby at greater risk of poor health. A prehabilitation programme leads to minimal important changes for the primary outcome, and many of the secondary outcomes already at 8 weeks follow-up.

**Keywords:** chronic low back pain, cognitive behavioural approach, lumbar fusion surgery, physical activity, person-centred care, prehabilitation.