Summary
Low back pain is a common disorder in industrialised countries. The chance that someone may experience low back pain during her/his life is 49 to 70%. In most cases (80-95%) there is no identifiable pathophysiological origin, which is often labelled as non-specific low back pain. The prognosis for non-specific low back pain is usually good, as complaints improve rapidly within weeks, but recurrences are common. Guidelines on the management of non-specific low back pain recommend to: reassure that the low back pain is likely to resolve rapidly; advise to stay active and continue daily activities; if necessary, supported by prescribing analgesics. When complaints persist over six weeks, guided activating therapies are considered.

Certain working populations, like health care workers, suffer even more often from low back pain. To prevent low back pain, workers can use lumbar supports. However, lumbar supports seem not effective as primary preventive intervention. Secondary analyses from primary preventive studies suggest benefit among workers with previous low back pain, but definitive studies on the effectiveness of lumbar supports for the secondary prevention of low back pain were lacking.

To determine the secondary preventive effectiveness of lumbar supports for low back pain, a randomised controlled trial was conducted (Chapter 2). 360 home care workers with self-reported history of low back pain received usual care, comprising a short course on healthy working methods, with or without patient-directed use of one of four types of a lumbar support. Primary outcomes were the number of days of low back pain and sick leave over 12 months. Over 12 months, participants in the lumbar support group reported an average of 52.7 days (95% CI, −59.6 to −45.1 days) fewer days with low back pain than participants who received usual care only. However, the total sick days in the lumbar support group did not decrease statistically significantly (−5 days; 95% CI, −21.1 to 6.8 days). Limitations of the study were unblinding of the participants, incomplete or missing data and the lack of objective data on sick days due to low back pain. From the results of the randomised controlled trial it was concluded that patient-directed use of lumbar supports may reduce the number of days on which low back pain occurs, but not overall work absenteeism, among home care workers with previous low back pain. There is a need for more evidence to confirm these findings, also in other working populations.

Apart from the physical complaints, low back pain is an economical burden to society. To assess the cost-effectiveness of wearing a lumbar support for home care workers with recurrent low back pain, an economic evaluation (Chapter 3) from a societal perspective was conducted alongside the previously mentioned 12-month randomised controlled trial. For this cost-effectiveness study, direct costs, indirect costs and quality of life (EuroQol) were measured by means of cost diaries in addition to the self-reported days with low back pain.
pain and calendar days sick leave in general. Differences in mean costs between groups, cost-effectiveness, and cost-utility ratios were evaluated, and cost-effectiveness planes and acceptability curves presented by applying non-parametric bootstrapping techniques. During the intervention period direct costs were € 235 lower (95% CI -386 to -79) for the home care workers using a lumbar support in addition to usual care. Indirect costs were not statistically significantly lower (€-255; 95% CI -879 to 299). There were no differences in quality of life. In conclusion, lumbar support seem a cost-effective addition to usual care for home care workers with recurrent low back pain. For estimating the indirect costs it would have been more precise when an objective measure for low back pain related sick leave would have been available.

In the study population of the randomised controlled trial described in chapter 2 and 3, medication was the most common treatment option within usual care. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most frequently prescribed medications worldwide and account for 80% of the prescriptions for patients with low-back pain. We performed a systematic Cochrane review (Chapter 4) to assess the effectiveness of NSAIDs and selective COX-2 inhibitors currently available and used for patients with low-back pain. Therefore the MEDLINE and EMBASE databases and the Cochrane Central Register of Controlled Trials were searched up to and including June 2007 if reported in English, Dutch or German. We also screened references given in relevant reviews and identified trials. Randomised trials and double-blind controlled trials of NSAIDs in non-specific low-back pain with or without sciatica were included. In total, 65 trials (total number of patients = 11,237) were included in this review. Twenty-eight trials (42%) were considered high quality. Statistically significant effects were found in favour of NSAIDs compared to placebo, but at the cost of statistically significant more side effects. There was moderate evidence that NSAIDs are not more effective than paracetamol for acute low-back pain, but paracetamol had fewer side effects. There was moderate evidence that NSAIDs are not more effective than other drugs for acute low-back pain. There was strong evidence that various types of NSAIDs, including COX-2 NSAIDs, are equally effective for acute low-back pain. COX-2 NSAIDs had statistically significantly fewer side-effects than traditional NSAIDs. The evidence from the 65 trials included in this review suggests that NSAIDs are effective for short-term symptomatic relief in patients with acute and chronic low-back pain without sciatica. However, effect sizes are small. Furthermore, there does not seem to be a specific type of NSAID which is clearly more effective than others. The selective COX-2 inhibitors showed fewer side effects compared to traditional NSAIDs in the RCTs included in this review. However, in recent studies COX-2 inhibitors are associated with increased serious cardiovascular risks in specific patient populations.
Returning to the lumbar support, another aspect of it was explored. Currently, the potential mechanisms of action of lumbar supports are still under debate. We explored the possible influence of lumbar supports on working postures of home care workers with ambulatory accelerometry (Chapter 5). In this pilot study, the rate of occurrence and duration of working postures of seven maternity nurses were monitored for two consecutive working days with an Activity Monitor. Randomly assigned, the workers used a lumbar support on either the first or second day. On average, the working postures were monitored for 9 hours per day. They were not hampered by the Activity Monitor in performing their job. The rate of occurrence and duration of working postures above 30° trunk flexion all tended to be less on the day the subjects used a lumbar support, while the rate of occurrence and duration of trunk postures less than 30° increased. Statistical significance of the differences between the working day with or without lumbar support was not reached in this small sample. Thus, lumbar supports seem to influence the working posture of home care workers. In future research, there is a high potential in ambulatory measuring working postures with ambulatory accelerometry.

Implementing a lumbar support as a secondary preventive aid, involves behavioural change of its users. To target the use of lumbar supports on those persons who can benefit optimally from usage, we need to know why people are adherent. We used the attitude, social support and self-efficacy model, which is developed to explain health behaviour, to identify determinants for prolonged adherence to wearing a lumbar support in the intervention group of the randomised controlled trial (Chapter 6). In the multivariable model, the strongest predictor for the intention for sustained use of a lumbar support was a positive attitude towards lumbar supports, explaining 41% of the variance ($B = 1.31; p < .001$). Social support and self-efficacy both explained 2% of the variance, of which only the latter was statistically significant ($B = 0.22; p < .05$). In conclusion, the intention for prolonged use of a lumbar support for workers with recurrent back pain was mainly explained by a positive attitude. The discomfort of a lumbar support was outweighed by perceived benefit. Reducing practical hindrances and creating sufficient social support for using the support within the organisation, are factors that may help to enhance adherence with the use of lumbar supports.

Finally, Chapter 7 reflects on the described studies in this thesis. Results, limitations, practical implications, and implications for future research of the described studies are integrated, and put in the context of other research in this area. In this, amongst others the following topics are addressed: low back pain calendars to measure low back pain; measuring sick leave; missing data; blinding; secondary prevention and health behaviour; and home care as research setting.