What is already known on this topic

**Theme A. Introduction of a combined physical and psychological (CPP) programme**
- Worldwide, chronic low back pain (CLBP) is responsible for the greatest disease burden for society in terms of years lived in disability.
- CLBP is not a diagnosis, but a symptom referring to the location of the problem and the duration of the complaints.
- Although the exact aetiology is unknown it is recommended to identify subgroups benefitting different interventions, as it is unlikely that one treatment benefits all.
- Multidisciplinary conservative treatment programmes provide moderate, short-lived effects.

**Theme B. Outcomes assessment**
- A patient outcome registry is an organized system that uses observational study methods.
- A patient outcome registry can be used to describe care patterns, including appropriateness of care and disparities in the delivery of care.
- Worldwide several spine outcome registries have been initiated on a regional or national level, tracking tens of thousands of patients.
- It is suggested that outcome registries leads to demonstrable improvement in clinical outcomes and smaller variation between providers.
- Participation in nationwide quality improvement initiatives including continuous quality monitoring and benchmarked feedback reveals opportunities for targeted improvements.
- Different core outcome sets for CLBP exist to standardize outcomes in research.
- An outcome set for use in every day clinical practice and to use for continuous improvement of the quality of spine care is still lacking.

- Functional ability is one of the recognised outcome domains of treatments for degenerative lumbar spine disorders.
- The Oswestry Disability Index (ODI) is a widely used patient-reported outcome measure (PROM) and internationally recommended to evaluate functional ability in these patients.

- The interpretation of pre- and post-treatment scores of PROMs has been a topic of research for more than two decades and is still subject to discussion.
- To evaluate the course and effect of interventions in patients with degenerative lumbar spine disorders different measures of improvement in functional ability are used.
What this thesis adds

**Theme A. Introduction of a combined physical and psychological (CPP) programme**
- The intensive multidisciplinary CPP programme is beneficial in improving and maintaining patient relevant outcomes and reducing healthcare consumption for a carefully selected group of patients with CLBP (Chapter 2-3).
- The study results are comparable with previously published results of spinal surgery and seem to be even better than results from less intensive rehabilitation programmes (Chapter 2).
- Patients who are employed and who are mild to moderately disabled at the start of a CPP programme are most likely to benefit from this programme (Chapter 4).

**Theme B. Outcomes assessment**
- The current impact and value of spine registries on quality of care is not yet established, regardless as to whether the intervention was non-surgical or surgical (Chapter 5).
- Methodological recommendations are presented to make future evaluations and comparisons possible (Chapter 5). The recommendations comprise the organisation of outcome registries, the methods and patient-related outcomes and influencing (risk) factors used, and the analysis and reporting of results.
- Application of these recommendations could lead to registries showing trends in effectiveness of interventions, monitoring the quality of spine care given, and ultimately improving the value of the care given to patients with degenerative spinal disorders (Chapter 5).
- An international multidisciplinary consensus-based standard set of well-validated outcomes for CLBP was defined and is recommended for use in both clinical practice and research (Chapter 6).
- These outcome measures are structured around the span of a patient’s entire cycle of care, and allow for risk adjustment (Chapter 6).
- When implemented, this set facilitates meaningful comparisons of interventions and between providers, ultimately providing a continuous feedback loop, enabling on-going improvements in quality of care (Chapter 6).
- The Dutch ODI version 2.1a is a valid, reliable and useful tool with for the assessment of functional ability and disability among Dutch patients with CLBP (Chapter 7).
- The use of the Dutch ODI is recommended for future research in patients with degenerative lumbar spine disorders and for evaluating outcomes of secondary and tertiary spine interventions in the Netherlands (Chapter 7).
- Absolute measures as a criterion of treatment success is recommended, because it is independent of the pre-treatment value and it represents the patients’ perspective: ‘It’s good to feel better but it’s better to feel good.’ (Chapter 8).
- An ODI score ≤22 indicates the achievement of a patient acceptable symptom state (PASS), which also reflects a ‘normal’ healthy condition (Chapter 4 and 8).
What is already known on this topic

Continued from page 272

- To define treatment success two concepts are current: (1) relative change values and (2) the achievement of an acceptable symptom state by reaching an absolute value.
- International consensus exists to use a relative change in ODI score to indicate relevant improvement in functional ability in CLBP: (1) 30% reduction from baseline ODI score, or (2) a 10 or 15 points reduction from baseline ODI score.
- Several drawbacks of change measures are acknowledged. For instance, the definition of clinical/relevant importance or meaningful change is still arbitrary and change scores are baseline dependent.

Theme C. Prediction of outcomes

- CLBP is a heterogeneous condition with a lack of diagnostic clarity and is one of the most common complaints for which patients seek consultation in primary care.
- It is estimated that 60-80% of the patients experience persistence of CLBP complaints after a year and most of them consult secondary care spine specialists for their problems.
- In secondary care a large practice variation exists, as currently many of these healthcare providers cannot reliably identify which CLBP patients will benefit most from a (non-) surgical intervention.
- Lumbar spine surgeries represent a sizeable proportion of the total cost of back pain, but spine surgery rates vary extensively across, and even within, countries.
- A lack of professional consensus among Dutch spine surgeons exists in decision-making for spinal fusion and it is indicated that patient-related factors were not consistently incorporated in the surgeons’ treatment strategy.

- To improve treatment outcomes in degenerative lumbar spine disorders it is recommended to develop a classification system to direct both surgical and non-surgical interventions, based on biomedical and psychosocial indicators and on treatment outcomes.
- Different non-surgical decision tools exist; none of them are aimed for patient triage.
What this thesis adds

Continued from page 273
- The ODI-PASS is recommended for use alongside the commonly used change-score measures in patients with degenerative lumbar spine disorders to evaluate the recovery and the course of interventions, irrespective of the invasiveness (Chapter 8).
- On an individual level the threshold could be used to indicate whether or not a patient with a degenerative lumbar spine disorder is a 'responder' after elective surgery (Chapter 8).

C. Prediction of outcomes
- The Nijmegen Decision Tool for Chronic Low Back Pain (NDT-CLBP) was developed using scientific evidence and formal multidisciplinary consensus (Chapter 9) and is internally validated to support patient triage to surgical and non-surgical spine specialists (Chapter 11).
- The online NDT-CLBP consists of: (1) a pre-treatment patient-based screening questionnaire, based on biomedical and psychosocial patient-reported indicators; (2) systematic outcome monitoring; (3) prognostic patient-reported profiles predicting treatment outcomes of spine surgery and a multidisciplinary treatment programme (Chapter 9 and 11).
- By means of pre-treatment patient-reported screening data derived from screening questionnaire of the NDT-CLBP, several patient-reported indicators were identified that are partly predictive of spinal surgery referral (e.g. previous surgery, leg pain intensity, positive treatment expectations, comorbidities, reduced walking distance) (Chapter 10).
- Location of consultation was significantly associated with spinal surgery referral, even after correcting for case-mix indicators, which suggests a practice variation and a lack of consensus among spine surgeons (Chapter 10).
- The NDT-CLBP is a tool for (shared) decision-making and includes two phases: (1) prognostic patient profiles, based on patient-reported characteristics predicting either 'response' or 'non-response' to treatment, to enhance timely patient triage to a spine surgeon or a non-surgical specialist for consultation, and (2) based on further diagnostics (e.g. imaging) and future research the profiles will be refined by including both the indicators from the first phase as well as from the diagnostic phase, to reliably refer the right patient to the right treatment (Chapter 11). A 'proof-of-principle' tool for phase 1 is developed; phase 2 is planned, but is beyond the scope of this thesis.
- Although factors derived from the diagnostic phase (e.g. imaging) were not included, treatment outcome was predicted to an acceptable and satisfactory degree, especially for non-response to spinal surgery (Chapter 11).
- To our knowledge we are the first to identify prognostic patient profiles predicting whether CLBP patients are a ‘responder’ or ‘non-responder’ to elective lumbar spine surgery or multidisciplinary pain management programme that can be used for triaging CLBP patients to the right secondary care specialist (Chapter 11).
- The next step is planned and consists of external validation of the prognostic patient-reported profiles with new patients and using patient samples of other secondary spine practices. This will be followed by an impact analysis of these patient profiles on decision-making, treatment outcomes, and costs.