KNGF Guideline on Low Back Pain and Lumbosacral Radicular Syndrome

Edited by:

Dr N.M. Swart; Dr A.T. Apeldoorn; D. Conijn, MSc; G.A. Meerhoff, MSc; Prof. R.W.J.G. Ostelo

Koninklijk Nederlands Genootschap voor Fysiotherapie

Royal Dutch Society for Physical Therapy

Vereniging van Oefentherapeuten

Amersfoort, October 2021

All sections of the guideline, including the summary, are available at **kngf.nl/kennisplatform**

Koninklijk Nederlands Genootschap voor Fysiotherapie

Royal Dutch Society for Physical Therapy

VvOCM

Vereniging van Oefentherapeuten

The KNGF Guideline on Low Back Pain and Lumbosacral Radicular Syndrome is a publication of the Royal Dutch Society for Physical Therapy (Koninklijk Nederlands Genootschap voor Fysiotherapie – KNGF) and the Association of Cesar and Mensendieck Exercise Therapists (Vereniging van Oefentherapeuten Cesar en Mensendieck – VvOCM).

Please site this guideline as follows: KNGF Guideline on Low Back Pain and Lumbosacral Radicular Syndrome. Amersfoort/Utrecht: KNGF/VvOCM; 2021.

Guideline panel

Prof. P.J. van der Wees	chairman of the guideline panel
L. Voogt	patient representative, representative of the PF
Dr W.T.M. Enthoven	general practitioner, representative of the NHG
Dr X. Zuidema	anaesthesiologist, representative of the NVA
Dr P.P.F.M. Kuijer	work-related movement specialist, representative of the NVAB
D. Vandeput, MSc	physical therapist, representative of the WVVK
J.H.C. Kloth, MSc	exercise therapist, representative of the VvOCM
M. van Veelen, MSc	psychosomatic physical therapist, representative of the KNGF-NFP
Y. de Leeuw-van Zaanen, MSc	company physical therapist, representative of the KNGF-NFP KNGF-NVBF
M. Ghoochannejhad, MSc	sports physical therapist, representative of the KNGF-NVFS
F. Maissan, MSc	physical therapist, manual therapist, representative of the KNGF-NVMT
H. van Helvoirt	physical therapist in a secondary care setting, representative of the KNGF
T.R.M. van den Meiracker, MSc	physical therapist in a primary care setting, representative of the KNGF

NFP = Nederlandse Vereniging voor Fysiotherapie volgens de Psychosomatiek (Dutch Society for Physical Therapy According to Psychosomatics); NHG = Nederlands Huisartsen Genootschap (Dutch College of General Practitioners); NVA = Nederlandse Vereniging voor Anesthesiologie (Dutch Society of Anaesthesia); NVAB = Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde (Netherlands Society of Occupational Medicine); NVBF = Nederlandse Vereniging voor Bedrijfs- en arbeidsfysiotherapeuten (Dutch Association for Company Physical Therapists and Occupational Therapists); NVFS = Nederlandse Vereniging van Fysiotherapie in de Sportgezondheidszorg (Dutch Society for Physical Therapy in Sports Medicine); NVMT = Nederlandse Vereniging voor Manuele Therapie (Dutch Society for Manual Therapy); PF = Patiëntenfederatie (Dutch Patient Federation); VvOCM = Vereniging van Oefentherapeuten Cesar en Mensendieck (Association of Exercise Therapists Cesar and Mensendieck); WVVK = Wetenschappelijke Vereniging van Vlaamse Kinesitherapeuten (Scientific Association of Flemish Physiotherapists).

Review panel

Prof. P.J. van der Wees	chairman of the guideline panel
Prof. M.W. van Tulder	researcher
Dr B. Staal	researcher, instructor
Dr J.D. Bier	physical therapist in a primary care setting
M.J.A. Edelaar, MSc	physical therapist in a secondary care setting
N. de Vries	geriatric physical therapist, representative of the KNGF-NVFG
W.J.M. Tempelaars, MSPT / J.C.P. Jesterhoudt, MSPT	pelvic physical therapist, representative of the KNGF-NVFB
M.G. Mooren	exercise therapist, representative of the VvOCM
M. Naeff, MSc	sports medicine physician, representative of the VSG

Dr D.F.M. Pakvis	orthopaedic surgeon, representative of the NOV
Dr B. Brouwer	neurologist, representative of PA!N
T. Kahraman, MSc	rehabilitation physician, representative of the VRA
A. te Molder (until 31 March 2020), J. van Vliet, MSc (starting on 1 April 2020) and C. Stevens	representative of the ZN
Dr H.S. Miedema	medical advisor of the ZIN

NOV = Nederlandse Orthopedische Vereniging (Dutch Orthopaedic Association); NVFB = Nederlandse Vereniging voor Bekkenfysiotherapie (Dutch Association for Pelvic Physiotherapy); NVFG = Nederlandse Vereniging voor Fysiotherapie in de Geriatrie (Dutch Society for Physical Therapy in Geriatric Care); PA!N = Pain Alliantie in Nederland (Pain Alliance in the Netherlands); VRA = Nederlandse Vereniging van Revalidatieartsen (Dutch Society of Rehabilitation Physicians); VSG = Vereniging voor Sportgeneeskunde (Society for Sports Medicine); VvOCM = Vereniging van Oefentherapeuten Cesar en Mensendieck (Association of Cesar and Mensendieck Exercise Therapists); ZIN = Zorginstituut Nederland (Healthcare Institute of the Netherlands); ZN = Zorgverzekeraars Nederland (Dutch Healthcare Insurance Companies); MSPT = Master of Specialised Physical Therapy.

Core group

Dr N.M. Swart	guideline adviser, KNGF project manager
Dr A.T. Apeldoorn	researcher, instructor, physical therapist, manual therapist
D. Conijn, MSc	guideline adviser, VvOCM policy adviser
G.A. Meerhoff, MSc	KNGF quality policy manager
Prof. R.W.J.G. Ostelo	researcher

VvOCM = Vereniging van Oefentherapeuten Cesar en Mensendieck (Association of Cesar and Mensendieck Exercise Therapists).

Table of contents

Inhoudsopgave

A General information

A.1 Introduction

Reason for guideline revision

Since the publication of the KNGF Guideline on Low Back Pain in 2013 and the VvOCM Guideline on Non-Specific Low back complaints in 2009, new insights have been obtained with regard to diagnosing and treating patients with low back pain. In order to offer patients with low back pain the right therapeutic intervention(s) for the right goals – at the right place within the healthcare process – and to decrease practical variations, a revision of the existing guidelines for physical therapy and exercise therapy Cesar/Mensendieck for patients with low back pain was needed. This revision is a part of the agreements stemming from the System Advice. The close correlation between physical therapy and exercise therapy was the impetus for the KNGF and VvOCM to merge the KNGF guideline from 2013 and the VvOCM guideline from 2009 into one joint guideline.

Goal of the guideline

The aim of this guideline is to provide a handbook for the daily practice of physical therapists and exercise therapists in diagnosing and treating patients with low back pain. By systematically evaluating scientific research and considering patient preferences and professional expertise, the KNGF Guideline on Low Back Pain supports therapists and patients in the clinical decision-making process and also offers transparency for other healthcare providers and stakeholders. Recommendations in a guideline are not laws or mandatory rules. In principle, therapists should adhere to the guideline, but substantiated deviation is legitimate or even necessary if this is commensurate with the individual patient's situation and wishes.

Target group

The guideline concerns low back pain and lumbosacral radicular syndrome (LRS).

> Low back pain means back pain between the lowest ribs and the buttock folds. The low back pain may be accompanied by sciatica into one or both buttocks and/or legs.
> LRS means pain in the buttocks and/or sciatica (radiating pain) into the leg, accompanied by multiple complaints or symptoms suggestive of a condition of a specific lumbosacral nerve root, such as tingling sensations (paraesthesia) and neurological loss of function (hypoesthesia/hypoalgesia, paresis, diminished reflexes).

Whenever 'low back pain' is mentioned, this means both low back pain and LRS, without signs that could indicate an underlying serious pathology. If different or supplementary recommendations apply to patients with LRS, these are described in a separate section.

The current guideline applies to patients with an initial or relapse episode of low back pain and covers all phases of back pain: acute (0–6 weeks), subacute (6–12 weeks) and chronic (> 12 weeks).

This guideline does not apply in the case of:

- a rare serious cause of the low back pain or LRS (see B.1.3 'Red flags'), such as:
  - inflammation (e.g. ankylosing spondylitis, organ conditions);
  - serious spinal column pathology (e.g. malignancies, infections, vertebral fractures);
  - serious neurological symptoms as a result of spondylolysis, spondylolisthesis, foraminal or canal stenosis;
- an LRS plus severe motor deficit (Medical Research Council (MRC) score ≤ 3 out of 5), and/or severe pain (NPRS ≥ 8);
- a patient aged 16 years or younger;
- pregnancy-related low back pain and/or pelvic pain;
- coccygodynia (tailbone pain);
- low back and/or pelvic pain based on visceral problems;
- complaints that can be directly related to a surgical procedure on the low back in the past 12 months.

Intended users of the guideline

This guideline is primarily aimed at physical therapists and exercise therapists who treat patients with health problems stemming from low back pain, regardless of the setting (a primary care practice, hospital or rehabilitation facility; monodisciplinary or multidisciplinary setting).
The guideline is also relevant for other healthcare providers who are involved in advising and treating patients with low back pain, such as general practitioners, company physicians, insurance company physicians, psychologists, neurologists, orthopaedic surgeons, neurosurgeons, rehabilitation physicians, sports medicine physicians, anaesthesiologists-pain specialists, as well as for patients, policy-makers and other organisations involved in the care of patients with low back pain.

Reading guide

The information in the guideline is divided into Section A 'General', Section B 'Diagnostic process' and Section C 'Therapeutic process'. The general information in Section A contains the general introduction, background information about the condition of low back pain and information about how the healthcare is organised. The Diagnostic process and Therapeutic process sections describe the respective methodologies. The various topics within a section make up separate, stand-alone modules. In each module, the information is subsequently divided into three levels, which each level going more in-depth into the respective topic:

- The practical tips, the recommendations, are included in the Practice Guideline (the first level).
- The information about the topic being addressed and the consideration of the most important arguments that lead to the recommendation or description are contained in the notes (the second level).
- The Justification (the third level) provides details about how this information was collected (including the search strategy, summary of results, evaluation of the evidentiary value and description of considerations), the process with which this consideration came about and the references of the (scientific) literature used.

Where this document refers to 'he', this can also mean 'she'.

Methodology

This guideline was developed in accordance with the KNGF Guideline Methodology 2019. The way this methodology was applied and the manner in which stakeholders were involved in the development are described in the justification of this module.

Definitions and terms

Note A.1 describes the most important definitions and terms used in this guideline.

A.2 Background of low back pain and LRS

A.2.1 Epidemiology, pathophysiology and co-morbidity

Epidemiology

Low back pain occurs in all age groups. The prevalence of low back pain is highest in the 40 to 80 year old population. It is estimated that every year 1.4 to 20% of adults in high-income countries experience low back pain and that 50-80% of adults have experienced a low back pain episode one or more times in their life. In Dutch general practices, slightly fewer than 900,000 new cases of low back pain occurred in 2017. The men to women ratio was 45:55. In 30% of cases this concerned sciatica. The actual number of new cases of low back pain is higher because some of the patients are not seen by the general practitioner; they go straight to another healthcare provider or don't seek care. There are no exact data about the number of patients with low back pain in physiotherapeutic/exercise therapeutic practices in the Netherlands.
Every year approximately 1 to 5% of adults suffer from a lumbosacral radicular syndrome (LRS).

Pathophysiology

In many cases, low back pain and the associated limitations can be viewed as a multifactorial problem, whereby biological, psychological and social factors, co-morbidity and pain processes play a role and influence each other. There is often no clear demonstrable pathophysiological cause. Serious causes such as fractures and inflammations are only found in fewer than 1% of people with back pain who seek out healthcare in a primary care setting.
LRS usually concerns a hernia nuclei pulposi (HNP) (herniated disc), in most cases in the lumbar spine at level L4-L5 or L5-S1.

Co-morbidity

People with low back pain experience certain conditions more often than people without low back pain. This concerns asthma, diabetes, headache, osteoarthritis, osteoporosis and cardiovascular problems, among others. Pelvic floor problems also occur in patients with low back pain.
Co-morbidity results in increased use of care and has a negative effect on the prognosis of low back pain. There is as yet little clarity about the exact nature of the correlations between co-morbidity and low back pain.

A.2.2 Societal impact

Low back pain is one of the main causes of limitations in daily life nationally and internationally. The many limitations in a minority of the people with low back pain in combination with the frequent occurrence of low back pain creates a very large societal impact. The medical costs of

healthcare for neck and back complaints amounted to EUR 937 million in 2017. This equates to 14% of the total healthcare costs incurred for musculoskeletal system and connective tissue diseases and 1.07% of the total costs of healthcare in the Netherlands. Of the healthcare expenditures for neck and back complaints, 62% was spent on hospital care, 12% on primary care and 11% on other providers. Comparable numbers for non-medical costs (such as absence from work or loss of productivity) are not available, but the ratio of medical costs to non-medical costs is estimated to be 12% for medical and 88% for non-medical costs.

A.2.3 Clinical presentation and course

- For many people, low back pain is a dynamic condition whereby episodes of little to no back pain alternate with episodes of moderate to severe back pain.
- An episode of low back pain can start slowly or acutely.
- After one month approximately a quarter and after three months approximately half of patients are recovered with regard to pain and physical functioning. After three months the recovery is slower and some patients still have complaints after 12 months.
- Approximately 70% of patients are back at work after one month, and 90% after three months.
- One to two in three people have a chance of relapsing within one year of recovery from a previous episode.
- The course of low back pain is less favourable if the low back pain is accompanied by leg pain.
- In practice, LRS cannot always be easily distinguished from referred pain in the leg (sciatica stemming from joints, ligaments, discs, etc. without compression or irritation of the lumbosacral nerves). The typical clinical picture of LRS is severe, sharp, shooting pain, with the distribution of pain and/or paraesthesia running along a specific dermatome. The pain is often more severe in the leg than in the back and can get worse during moments of increased pressure. Referred pain in the leg is generally indicated as diffuse pain, does not radiate under the knee and is less intense than the low back pain.
- There are still many uncertainties about the course of LRS.

A.2.4 Etiological and prognostic factors

Etiological factors

Factors that can play a role in the onset of low back pain and LRS or the occurrence of a new episode of low back pain or LRS are included in the following overview.

Etiological factors that may possibly contribute to the onset of low back pain and LRS are:

- Factors related to back pain
  - previous episodes of low back pain
- Patient-related factors
  - overweight and obesity
  - smoking
  - co-morbidity
- Psychosocial factors
  - depression

Work-related factors
- high degree of physical load at work
- high degree of mental stress at work
- little social support at work
- few options to independently fulfil work tasks
- little job security
- very monotonous work

Recommendation

Assess the etiological factors during medical history taking (see B.1.1 'Medical history taking'). These factors can play a role in the onset of (initial or recurring) low back pain. The information obtained is used to provide targeted information and advice about the onset of complaints (see C.1 'Information and advice and (pain) education').

Prognostic factors for persistent complaints

Factors that influence the prognosis (course of the complaints) are called prognostic factors. The following overview lists the prognostic factors that are associated with persistent low back pain and LRS.

Prognostic factors that are associated with persistent low back pain and LRS

Factors related to back pain
- previous episodes of low back pain
- a high degree of limitations in activities
- pain in the leg
- high intensity of pain

Patient-related factors
- bad general health status or quality of life

Psychosocial factors
- psychological and psychosocial stress*
- pain-related fear of movement
- feelings/symptoms of depression
- passive coping style
- negative expectations about recovery or catastrophisation

Work-related factors
- high degree of physical load at work
- bad relationships with colleagues
- diminished job satisfaction

* Stress without the presence of a specific psychological and psychiatric diagnosis.

Recommendations

Assess the prognostic factors for persistent low back pain and LRS that are listed in the overview. Although it is uncertain to which extent the prognostic factors predict the risk of persistent low back pain and LRS, it is plausible that a dominant factor or a combination of prognostic factors impedes the chance of recovery.

When analysing the prognostic factors, consider using the recommended and optional measurement instruments (see B.3 'Measurement instruments'). There are no strict cut-off values available for most measurement instruments, and use of strict cut-off values is also not recommended.

A.3 Organisation of healthcare

Gradual approach

The same gradual approach is used for the organisation of care as the one described for the Chronic Pain Healthcare Standard. The entry level is estimated based on the severity of the complaints, the capabilities of the patient and his/her environment and the patient's experiences with previous treatments. The NHG Standard on Non-specific Low Back Pain and the NHG Standard on LRS are guiding for the organisation of healthcare provided by general practitioners.

The phases of the gradual approach are:

- **Step 1** Prevention
- **Step 2** Monodisciplinary diagnosis and treatment in the primary care setting
- **Step 3** Multidisciplinary diagnosis and treatment in the primary care setting in close collaboration with the secondary care setting
- **Step 4** Multidisciplinary treatment in the secondary care or tertiary care setting.

Prevention (step 1)

Within the context of this guideline, prevention is aimed at people with beginning back complaints, with the goal of preventing these problems from becoming worse. Prevention is also aimed at people with low back pain in order to prevent these problems from leading to complications, limitations or decreased quality of life.

Monodisciplinary diagnosis and treatment in the primary care setting (step 2)

Diagnosis and treatment of patients with low back pain primarily takes place in the primary healthcare setting. The general practitioner plays an important role in this as a diagnostician and referrer. Physical therapists and exercise therapists treat patients through direct accessibility or by referral from general practitioners or medical specialists.

Multidisciplinary diagnosis and treatment in the primary care setting in close collaboration with the secondary care setting (step 3)

In the case of long-term low back complaints with a moderate impact on the level of physical activity where monodisciplinary diagnosis and treatment have produced inadequate alleviation of complaints, the preference is to scale up to step 3. Multidisciplinary treatment in the primary care setting, if necessary, in close collaboration with the secondary care setting, consists of treatment by multiple disciplines. Such a multidisciplinary team offers adequate biopsychosocial healthcare which, in addition to the general practitioner, may consist of various (para)medical professionals, for example also a psychologist and/or psychiatrist, and a pain consultant. With multidisciplinary treatment in the primary care setting in collaboration with the secondary care setting, it is important for coordination to take place between the various disciplines and for there to be one central point of contact for patients and the involved (para)medical professionals.
There is no consensus about who organises the multidisciplinary collaboration or who coordinates the care within the current healthcare landscape of patients with low back pain. This consensus is needed in order to give substance to the organisation and coordination of the multidisciplinary collaboration. The physical therapist or exercise therapist must by all means enter into consultation at the local or regional level on how multidisciplinary collaboration has been or

can be organised. Within this multidisciplinary collaboration it should also be discussed who coordinates the multidisciplinary collaboration and is also the point of contact.

Multidisciplinary treatment in the secondary care or tertiary care setting (step 4)

Complex problems with a severe or very severe impact on the level of physical activity and/or major suffering and inadequate alleviation of the complaints in the primary care setting require multidisciplinary diagnosis and treatment in the secondary or tertiary care setting. The patient can be referred by the general practitioner. The Chronic Pain Healthcare Standard contains examples of how such a team could look like.
Complex problems are understood to mean: long-term (>12 weeks) absence from work, multiple simultaneous health problems (co-morbidity), a high disease burden, severe and untenable pain and the presence of dominant, recovery-impeding psychosocial factors. Care in the secondary or tertiary care setting is only useful if the patient is intrinsically motivated to view the complaints from a biopsychosocial perspective and change recovery-impeding behaviour.

Collaboration

Several factors play a role in low back pain. Treatment of patients with low back pain therefore requires coordination between and collaboration with a large number of involved (para) medical professionals, including specialised physical therapists and exercise therapists and physical therapists and exercise therapists with special certification. To be able to achieve good collaboration, it's important for the involved (para)medical professionals to be aware of each other's position, role and (added) value. This knowledge is not only limited to one's own profession.
It is important for physical therapists and exercise therapists to have knowledge of and insight into the expertise of both the (para)medical professionals who are involved in the treatment of low back pain as well as the specialised physical therapists and exercise therapists and physical therapists with special certification. It is based on this knowledge and insight that the physical therapist and exercise therapist can assess whether he/she feels competent and authorised to provide an individual patient with physiotherapeutic or exercise therapeutic healthcare. If this is not the case, the patient will be referred (back) to the general practitioner or will be advised to contact a specialised colleague or colleague with special certification.
Physical therapy and exercise therapy specialisations that largely focus on treating patients with low back pain are: manual therapy, psychosomatic physical and exercise therapy, pelvic physical and exercise therapy, sports physical therapy, company physical therapy and occupational physical therapy and geriatric physical and exercise therapy. A description of the expertise of these paramedical professionals is included in Note A.3.

Recommendations

Amass knowledge of and insight into the expertise of the (para)medical professionals involved in the low back pain, including the specialised physical therapists and exercise therapists and physical therapists and exercise therapists with special certification.

Determine with the involved (para)medical professionals how multidisciplinary collaboration for patients with low back pain will be organised at the local or regional level.

Discuss amongst each other who will coordinate the multidisciplinary collaboration and also be the point of contact for patients and involved (para)medical professionals.

B Diagnostic process

B.1 Medical history taking and physical examination

B.1.1 Medical history taking

The goal of the medical history taking is to assess health problems related to low back pain and LRS by means of an interview. Requesting additional referral information is also part of the medical history taking.
In any case, the need for assistance, red flags (see B.1.3 'Red flags') and etiological and prognostic factors (see A.2.4 'Etiological and prognostic factors') are assessed. Based on the collected information, the physical therapist or exercise therapist conducts a targeted physical examination in order to determine whether there is an indication for therapy. Then treatable traits are identified for the treatment.
The following section contains an overview of the relevant topics that may be addressed in the medical history taking.

Overview of the relevant topics that may be addressed in the medical history taking:

Central

- the patient's need for assistance

Functions and anatomical characteristics

- duration, manner of onset and course of the complaints
- localisation, intensity and nature of the pain
- continuous or intermittent pain
- presence and localisation of sciatica into one or both buttocks and/or legs
- impact of rest, sleep and (specific) movements and postures on the complaints
- impact of moments of increased pressure, such as coughing, sneezing and pressing, on pain in the leg
- previous back complaints (duration, manner of onset, course, localisation of the pain, etc.)
- loss of strength, sensitivity disorders
- problems with urination/bowel movements

Activities and participation

- degree of impediment in daily functioning at home, at work, at school and during free time (hobbies and physical activity)
- presence of co-morbidity and related limitations in activities and participation (supplemented by referral information)
- balance between stress and capacity
- sexual dysfunction

External factors

- home situation (financial, marital status, etc.)
- social network and support (partner, family, friends, work)
- work situation (has/doesn't have paid work, relationship with colleagues, financial compensation, job satisfaction, job security, social support at work, options to independently fulfil work tasks, physical and mental stress at work).

Personal factors

- general malaise, unexplained weight loss, fever, night sweats
- general health status (smoking, body mass index (BMI), getting the recommended amount of exercise, etc.)
- medical history and current status: malignancy in the medical history, (positive) therapies, specialists, imaging exams, medical diagnoses, surgeries, medication, personal injury case, etc.
- degree of psychological and psychosocial stress, pain-related fear of movement, feelings/symptoms of depression and catastrophisation
- ideas and expectations about the onset and continuation of the complaints
- worries, specific questions and expectation with regard to the therapy
- degree of willingness/motivation/management strategies (self-efficacy, coping).

B.1.2 Physical examination

The goal of the physical examination is to further investigate health problems related to low back pain following the medical history taking.
The physical examination consists of an inspection and a movement examination. If a serious condition is suspected based on the medical history taking, then the patient can be specifically examined for this, if relevant. The following section contains an overview of the relevant aspects that may be addressed in the physical examination.

Overview of the relevant aspects that may be addressed in the physical examination are:

Inspection

- evaluation of the movement behaviour
- determination of the localisation of the complaints, such as pain and decreased sensation
- evaluation of the general statics (condition of the spine, pelvis and legs) and of the lumbar spine especially
- inspection of the skin (swelling, colour, scars, hair growth, spots, sweat secretion)
- evaluation of the muscles or muscle groups (symmetry, contours, size)
- evaluation of the breathing pattern
- examination of the muscle tone and the trigger points
- examination of the skin (displacement capability and elasticity)

Movement examination

- functional movement examination:
  - evaluation of the performance and quality of movement during activities where complaints are reported
  - evaluation of walking (up stairs), bending, transfers, getting dressed and undressed and other ADL activities relevant for the patient
  - evaluation of the use of aids
- active movement examination of the lumbar spine and pelvis:
  - evaluation of the functioning of the lumbar spine and the pelvis, muscles, fascia and nervous system for the following, among other things: mobility, stretchability, stretching sensitivity, contraction sensitivity
  - evaluation of the muscle strength
  - evaluation of the neuromotor control (e.g. flowing or abnormal/aberrant movements), stability and balance
  - investigation into pain-provoking and pain-reducing postures and movements
- passive movement examination of the lumbar spine and pelvis:
  - evaluation of the functioning of the lumbar spine and the pelvis, muscles, fascia and nervous system for the following, among other things: mobility, stretchability, stretching sensitivity, movement resistance and end-feel
- examination of the biomechanical and physiologically related joints of the lumbar spine and the pelvis, specifically the thoracic spine and the hips

Lumbosacral radicular syndrome (LRS)

If LRS is suspected based on the medical history taking, the therapist will conduct a neurological examination. The test that this examination entails are listed in the overview below.

Neurological examination if LRS is suspected

- examination of the pain distribution (connected or not connected to a dermatome) and
- examination of the fingertips-to-floor distance when bending forward with straight knees (positive if the distance is >25 cm), and
- the Lasègue test, the crossed Lasègue test or the reversed Lasègue test, and
- examination of the muscle strength (MRC score of the core muscles), and
- examination of the vital and gnostic sensibility (connected or not connected to a dermatome), and
- examination of the reflexes (Achilles tendon, knee tendon, soles of the feet).

Note: If the symptoms are suggestive of LRS but the complaints only occur when standing or walking, then also consider vascular claudication or intermittent neurogenic claudication (Verbiest syndrome).

Recommendations

In the event of suspected LRS, for example with symptoms under the knee, perform a neurological examination on the patient:

Be alert to emergency indications in patients with LRS, in the form of signs of a serious neurological problem (see B.1.3 'Red flags').

Refer the patient with LRS and severe motor deficit (MRC score ≤ 3 out of 5), and/or severe pain (NPRS ≥ 8) to the general practitioner. Check other patients with LRS after two to four days and act according to the recommendations in this guideline.

Refer the patient with LRS to the general practitioner if there is doubt about whether the medication dosage is high enough.

B.1.3 Red flags

It is important to be alert to signs that could point to an underlying, rare, serious pathology, such as cancer, an infection, a trauma, an inflammatory disease, or to serious neurological problems, such as cauda equina syndrome. A single sign does not necessarily indicate a serious pathology; a combination of multiple signs creases the probability that the complaints are caused by a specific condition (see the next table).

Clusters of signs that may indicate an underlying, rare, serious pathology, based on the guideline of the Federal Health Care Knowledge Centre (Federaal Kenniscentrum voor de Gezondheidszorg)

Neurological emergency • urine retention, faecal or urinary incontinence*, progressive motor weakness or proof of bilateral nerve root problems (cauda equina syndrome) • progressive neurological symptoms, such as severe motor deficit (MRC score ≤3 out of 5) and sensory disorders that occurred in less than 48 hours • widespread neurological symptoms (e.g. pyramidal signs)	**Action:** Referral to the general practitioner
Fracture • severe low back pain after a (high-energy) trauma • severe low back pain after a minor trauma or without the patient being aware of a trauma, but with increased chance of a fracture, such as with osteoporosis, long-term use of corticosteroids, advanced age, history of cancer and axial spondylarthritis	
Infection • night sweats • chills and elevated temperature • intravenous drug use • immunodeficiency • unexplained weight loss • known previous or concomitant systemic infection or risk of infection • recent surgical procedure • urinary or skin infection (tuberculosis, discitis, spinal abscess)	
Tumour • recent complaints of back pain <18 years or >55 years • history of cancer • unexplained weight loss • fatigue • severe night time pain and night sweats	

Inflammatory condition • constant, progressive, non-mechanical pain • responds well to NSAIDs • back pain improves with physical activity, but not at rest • familial component • severe night time pain • morning stiffness >30 minutes or waking up during the night for young patients • low back pain for more than five years (axial spondylarthritis)	**Action:** Referral to the general practitioner
Miscellaneous • increasing post-operative pain • unilateral pyramidal signs	

* Urine retention, faecal or urinary incontinence may also point to pelvic floor problems

Recommendations

Assess whether there are signs that could indicate an underlying, rare, serious pathology, as shown in the table.

If you suspect a serious pathology or in the event of doubt (you have a feeling of something not being right), always contact the general practitioner or referrer.

B.2 Indications and treatment profiles

Based on the medical history taking and the physical examination, determine whether there is an indication for physical therapy or exercise therapy.
There is an indication to start physical therapy or exercise therapy when:

- a patient with low back pain sees the physical therapist or exercise therapist with a need for assistance related to limitations in activities of daily living and/or social participation based on movement-related functioning, and
- the therapist sees no reason to refer the patient (back) to the general practitioner or referring specialist (see B.1.3 'Red flags').

If the indication for physical therapy or exercise therapy has been determined, the patient is assigned to a treatment profile based on the risk of persistent complaints.

Recommendations

Evaluate the risk of persistent complaints upon initial contact with the patient by assessing whether there are prognostic factors for persistent low back pain complaints:

- factors related to back pain: previous episodes of low back pain, a high degree of limitations in activities, pain in the leg, high intensity of pain;
- patient-related factors: bad general health status or quality of life;

- psychosocial factors: psychological and psychosocial stress[a], pain-related fear of movement, feelings/symptoms of depression, passive coping style, negative expectations about recovery or catastrophisation;
- work-related factors: high degree of physical load at work, bad relationships with colleagues, diminished job satisfaction.

The medical history taking and the physical examination may also yield other prognostic factors (related or not related to back pain). These may be recovery-impeding (such as pain elsewhere in the body and decreased capacity as a result of co-morbidity) or recovery-promoting prognostic factors (such as getting the recommended amount of exercise and a healthy lifestyle).

Choose treatment profile 1, 2 or 3 based on your evaluation of the risk of persistent complaints.

Treatment profiles

Treatment profile 1: low risk of persistent symptoms
There are no dominant prognostic factors for delayed recovery present.
Limit the treatment to a maximum of three sessions.

Treatment profile 2: moderate risk of persistent low back pain
There are some non-dominant prognostic factors for delayed recovery present.

Treatment profile 3: High risk of persistent low back pain
There are dominant prognostic factors for delayed recovery present.

Dominant/non-dominant: Estimate whether and to what extent the factor greatly contributes to perpetuating the pain and/or the limitations in physical functioning. A dominant presence is when the factor greatly contributes to perpetuating the pain and/or the limitations in physical functioning.

Note: No number of treatment sessions have been determined for profiles 2 and 3 because there is a large variation in the course of symptoms.

Based on the treatment profiles, consider offering simpler and less-intensive support to people who are likely to recovery quickly and more complex and intensive support to people with a higher risk of persistent complaints.

Lumbosacral radicular syndrome (LRS)

Because LRS is often associated with a high degree of limitations in activities, pain in the leg and high intensity of pain, these patients have a greater chance of being assigned to profile 3.

Repetition of the evaluation of the risk of persistent complaints

If there is an inadequate alleviation of complaints, repeat the evaluation of the risk of persistent complaints[b].

[a] Stress without the presence of a specific psychological psychiatric diagnosis.
[b] The patient, in consultation with the therapist, assesses whether there is an (in)adequate alleviation of complaints; this can be supported by measurement instruments (see B.3 'Measurement instruments').

Conduct a re-evaluation at least for:

- profile 1 after three weeks;
- profile 2 after three weeks and after six weeks;
- profile 3 after six weeks and after 12 weeks.

Re-evaluation for profile 1 and 2

- If there is an inadequate alleviation of complaints, consider adjusting the treatment profile (or the treatment) based on the re-evaluation.
- If there is an inadequate alleviation of the complaints, refer the patient to the general practitioner if the re-evaluation does not yield any new insights and you don't expect an adjustment of the treatment profile (or the treatment) to be sufficient.

Re-evaluation for profile 3

- Contact the general practitioner if there is an inadequate alleviation of the complaints after six weeks.
- Refer the patient to the general practitioner if there is an inadequate alleviation of the complaints after 12 weeks, and consult about the next phase in the gradual approach: multidisciplinary diagnosis and treatment in the primary care setting in close collaboration with the secondary care setting (see A.3 'Organisation of healthcare').

Refer the patient with LRS to the general practitioner if the complaints persist from six to eight weeks and if there is insufficient alleviation of pain and/or loss of function.

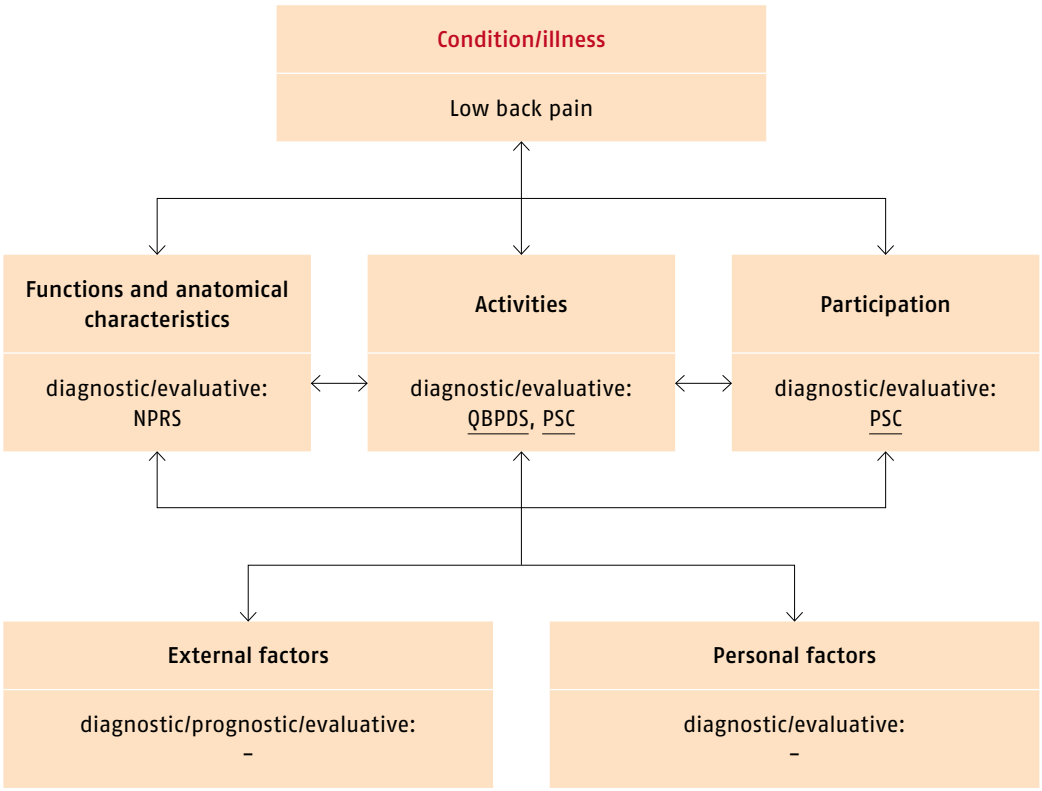
B.2.1 Classification systems

Consider using the STarT Back Screening Tool (SBST) to support the evaluation of the risk of persistent complaints (see B.2 'Indications and treatment profiles'). Never base the evaluation of this risk solely on the SBST.

B.3 Measurement instruments

Recommended and optional measurement instruments

Use the recommended measurement instruments (see figure) for all patients, unless there is a reason not to do this.



Note: No relevant measurement instruments are available for recommended use as a measurement instrument to identify external factors.

NPRS = 'Numeric Pain Rating Scale' (0–10, average pain in the past 24 hours); PSC = Patient-Specific Complaints; QBPDS = 'Quebec Back Pain Disability Scale' (0–100).

Recommended measurement instruments

The interpretation and measuring frequency of the recommended measurement instruments are listed in the following table.

Interpretation and measuring frequency of the recommended measurement instruments

Parameter	Pijnintensiteit	Activities/ physical functioning	Activities and participation in ADL
Measurement instrument	Numeric Pain Rating Scale (NPRS): average pain in the past 24 hours (0–10)	'Quebec Back Pain Disability Scale' QBPDS (0–100)	Patient-Specific Complaints (PSC) (0–10)
Interpretation	A higher score corresponds to more pain.	A higher score corresponds to more limitations.	A higher score corresponds to more limitations.

Measurement points*	Intake, interim evaluation, completion	Intake, interim evaluation, completion	Intake, interim evaluation, completion
Comments	Avg. score at baseline for short-term complaints (0-6 weeks): 5.2 (95% CI 4.8 to 5.7). There are some indications that a ≥30% improvement compared to baseline can be considered a clinically relevant improvement.	Avg. score at baseline for short-term complaints (0-6 weeks): 45 (95% CI 42 to 48). There are some indications that a ≥30% improvement compared to baseline can be considered a clinically relevant improvement.	

* The moment of the interim evaluation depends on the patient profile. See B.2.1 'Indications and treatment profiles' and C.5 'Completion of the treatment'.

CI = confidence interval

Only use the optional measurement instruments when there is a reason to do this. The optional measurement instruments are described in Note B.3.
Optional measurement instruments can be used for the following reasons:

- there is a reason for identifying a parameter for which none of the recommended measurement instruments are suitable, or
- there is a reason for identifying a parameter with a different measurement instrument than the measurement instrument recommended for this.

Based on the results of the questionnaires, you can opt to conduct an additional (movement) analysis or functional test (e.g. an analysis of the gait pattern if walking limitations were listed in the questionnaire).

C Therapeutic process

This section of the guideline contains the recommendations concerning the therapeutic process for patients with low back pain and LRS.

C.1 Information and advice and (pain) education

Type of information and advice

- Refer to the patient information compiled based on this guideline.
- Refer to thuisarts.nl for information about the medical care for low back pain provided by general practitioners.

- Integrate information and advice and education as a part of the therapy. The information and advice takes place during the preliminary stage, treatment and follow-up care.
- Provide the patient with clear, consistent and personalised information and communicate with empathy in clear, comprehensible language.
- Avoid language that encourages fear of pain and catastrophic thinking, terms like: injury, degeneration or wear and tear.
- Use the term 'low back pain' and avoid the term 'non-specific'.

Contents of the information and advice

Give patients with low back pain in treatment profiles 1, 2 and 3 information and advice about:

1. **The nature and diagnosis of the low back pain**

- Explain that it is often unclear exactly how low back pain arises and that there is often a combination of factors present.
- Explain that the vast majority of people with low back pain have no indications for an underlying rare condition.

2. **The course and prognosis of low back pain**

- Explain that low back pain occurs often and frequently returns, and that the extent of the low back pain can differ each time.
- Explain that after three months about half of patients are pain-free and physical functioning has been recovered.
- Explain that remaining active and limiting bed rest, self-management for recovery, active coping strategies, positive emotions and a healthy lifestyle are factors that can expedite recovery.

3. **Influenceable etiological factors (if applicable)**

- Explain that a number of etiological factors may contribute to the onset of (initial or recurring) low back pain (see A.2.4 'Etiological and prognostic factors'), but that these etiological factors are not also causal factors by definition.

4. **Influenceable prognostic factors (if applicable)**

- Explain that the presence of prognostic factors can cause the recovery to progress less rapidly (see A.2.4 'Etiological and prognostic factors').

5. **Diagnosis**

- Explain that diagnosis of low back pain typically takes place in the primary care setting, by the general practitioner and/or by the physical therapist or exercise therapist.
- Explain to patients who need information about imaging diagnostics (X-ray or MRI) that this type of diagnostics is not recommended for patients with low back pain without warning signs. Refer the patient to thuisarts.nl for more information.

6. **The treatment options**

Explain that treatment of low back pain typically takes place in the primary care setting, by the general practitioner and/or by the physical therapist or exercise therapist.
Explain that the treatment focuses on an active approach. Inform the patient about how to adequately deal with the pain and the consequences of pain.

Consider employing (pain) education in addition to information and advice for patients with profile 3, e.g. if there is unrealistic pain-related fear of movement and/or catastrophisation.

Lumbosacral radicular syndrome

Adapt the information and advice for patients with LRS with respect to:

1. **The nature of the complaints** (see A.2.1 'Epidemiology, pathophysiology and co-morbidity')

Explain that LRS is characterised by the stimulation of a nerve root in the back, usually due to a herniated intervertebral disc, and that this results in sciatica and sometimes also in sensory disorders and loss of strength in the area innervated by this nerve. Also explain that the herniated intervertebral disc retracts on its own in most cases.

2. **The course and prognosis of LRS** (see A.2.3 'Clinical presentation and course').

Explain that LRS significantly recovers in most patients in the first three months, without requiring surgical intervention.

3. **Diagnosis**

Explain to patients who need information about imaging diagnostics (X-ray or MRI) that the medical specialist will decide whether or not the patient is eligible for this. Explain that an MRI is indicated if there are signs of a rare cause of the back complaints (red flags), or if the symptoms of LRS are so debilitating and/or long-lasting that surgery or another specialised therapy is considered. Also explain that proving an HNP by means of an MRI has no added value in conservative treatment.

4. **The treatment options**

Explain that, in case of an LRS, the treatment is generally conservative during the first three months.
Advise the patient to continue moving and engaging in daily activities (including work) if complaints permit. Explain that several days of bed rest is an option if moving causes a major exacerbation of the complaints, but that bed rest does not contribute to faster recovery.
Advise the patient to move guided by the pain and to gradually increase physical activity. But do keep in mind that increased pain should be prevented in the presence of high responsiveness. High responsiveness is defined as: a lumbar flexion ROM of 0 to 30 degrees, constant pain in the leg, night-time pain, morning pain or stiffness lasting longer than 60 minutes and when walking a short distance does not lead to pain alleviation. Moderate responsiveness is defined as intermittent moderate pain, with short-term increased pain (during a part of a day) being deemed acceptable.

- Explain that if the complaints have not sufficiently improved after six to eight weeks, a referral (back) to the physician / general practitioner will be provided so that the treatment options can be discussed: continued conservative treatment or a switch to surgical treatment. If the patient received a referral from a secondary care setting, then the physical therapist will refer the patient back to this specialist (see A.3 'Organisation of healthcare').

Advise the patient with LRS to immediately contact the general practitioner in the event of:

- saddle numbness;
- unintentional loss of urine or bowel movement or inability to urinate;
- increasing loss of muscle strength in the legs.

C.2 Exercise therapy

C.2.1 Exercise therapy interventions

Exercise therapy for patients with profile 1

Consider giving instructions for exercise therapy to be done independently for patients with a low risk of persistent complaints.

Exercise therapy for patients with profile 2 and 3

Offer exercise therapy for patients with a moderate or high risk of persistent low back pain.

Group exercise therapy

Consider group exercise therapy as a follow-up to one or more individual sessions, if you as a therapist estimate that group exercise therapy will lead to faster recovery.

Exercise therapy for patients with lumbosacral radicular syndrome

Consider exercise therapy if there is a need for assistance related to limitations in activities of daily living and/or social participation based on movement-related functioning.

Focus on pain alleviation in the presence of high responsiveness. In the presence of moderate responsiveness, increased pain of short duration (a part of a day) is acceptable.

If good progress is made, expand the activities to the prior level in 6 to 12 weeks based on the frequency, intensity and time span of the various types of exercise therapy (see C.2.2 'Type and dosage of the exercise therapy'). Increase the exercise therapy depending on the pain.

C.2.2 Type and dosage of the exercise therapy

Type

Encourage the patient to resume or expand activities, preferably gradually and in a time-contingent manner.

Focus the exercise therapy on the patient's needs, preferences and capabilities as determined during the medical history taking and the physical examination.

Integrate principles of behavioural change into the exercise therapy if you encountered a reason to do so during the diagnostic process (see C.3 'Behaviour-oriented treatment').

Consider functional training by integrating (parts of) activities in which the patient is limited into the exercise therapy.

Consider exercise therapy to improve muscle strength, aerobic endurance, flexibility and/or neuromotor control of the spine only if you as a therapist suspect that there is a connection between the determined functional disorder and the complaints.

Adapt the exercise therapy if co-morbidity impairs physical functioning.

Frequency, intensity and time span

When conducting muscle strength training, exercise therapy to improve aerobic endurance and exercise therapy to improve flexibility, aim for the frequency, intensity and time span as described in the following table.

Frequency, intensity and time span of the various types of exercise therapy

Muscle strength	
Frequency	• Training of a specific muscle group 2-3 days per week. • Maintain a recuperation period of 48 hours after intensive muscle strength training for the trained muscle group.[a]
Intensity	• Aim for 60-70% of the 1RM.
Time span	• 2-4 sets of 8-12 reps
Comments	• Apply a 30-60 second break between sets. • Adjust the intensity by adjusting the number of sets, the number of reps and the break between sets.
Aerobic endurance	
Frequency	• Moderate exertion at least 5 days per week or heavy exertion ≥3 days per week or a combination of moderate and heavy exertion ≥3-5 days per week.[a]
Intensity	• Heavy exertion (60-90% of the HRmax) for people who are used to aerobic endurance training. • Adjust the intensity to moderate exertion (40-60% of the HRmax) for people who are not used to aerobic endurance training. • Ensure that the intensity is increased gradually throughout the programme
Time span	• At least 30 minutes per day with a minimum time span of consecutive exercise for at least 10 minutes.
Comments	• Adjust the intensity of the exercise therapy for improving aerobic endurance by adjusting the time span of the exercises, the time span of the session and the breaks between the exercises.

Flexibility	
Frequency	• Preferably daily, but at least 2–3 days per week.
Intensity	• Exercise until you feel stretched or slight discomfort.
Time span	• For example, stretch 2–4 times for 10–30 seconds.
Comments	• Allow 8–10 minutes of physical activity prior to the stretching exercises.

[a] Tailor the build-up to the patient's capacity. RM: repetition maximum.

HRmax = maximum heart rate.

Because there is insufficient knowledge about the optimal frequency, time span and intensity of exercise therapy for improving neuromotor control, the recommendation is to coordinate these factors based on the patient's capabilities, with the accent being placed on the quality of exercise without increased pain.

If permissible, scale back the guidance during the treatment period. Do this in consultation with the patient. In this case, it is important to not decrease the exercise frequency and intensity; the focus will shift to independent exercising and physical activity.

When choosing the frequency, intensity and time span of the exercise therapy, take into account a dosage that is feasible enough for the patient to allow him/her to continue with the exercise therapy.

Inform the patient about possible responses to the exercise therapy. We can speak of an acceptable (desired) response if there is tolerable pain, fatigue or functional problems lasting for a maximum of 24 hours after the exercise therapy and then abating. We can speak of an undesired response if (night-time) pain, fatigue and loss of function increase after 24 hours.
Determine the duration of the exercise therapy prior to starting treatment in consultation with the patient, with the need for assistance and the treatment goals being leading. In doing so, take into account the severity and duration of the complaints, co-morbidity, the presence of prognostic factors and the possibility of self-management on the part of the patient.

Consider use of eHealth (digital healthcare) to support the patient in (continuing to) perform(ing) exercises independently and/or reducing the degree of guidance.

C.3 Behaviour-oriented treatment

Consider behaviour-oriented treatment in order to optimise physical activity and participation in patients with dominant (psychosocial) prognostic factors (see A.2.4 'Etiological and prognostic factors'). Behaviour-oriented treatment is understood to mean operant conditioning (e.g. graded activity), cognitive behavioural therapy (e.g. exposure in vivo) and respondent techniques (e.g. relaxation exercises). In this guideline, techniques stemming from or associated with behavioural therapy are also covered by behavioural therapy treatment. This includes techniques that utilise the relationship between cognitions, emotions and behaviour whose goal is to change how a patient copes with pain, Acceptance and Commitment Therapy (ACT), mindfulness and interview

techniques such as motivational interviewing. Pain education is a basic part of graded activity and exposure in vivo and is described in C.1 'Information and advice and (pain) education'. Focus your behaviour-oriented treatment on encouraging movement behaviour with or despite pain.

Consider personalising the behaviour-oriented treatment by aiming this specifically at the psychosocial prognostic factors, as described in the following table.

Psychosocial prognostic factors and associated treatment strategies (expert opinion)

Recovery-impeding factors	Treatment
pain-related fear of movement, catastrophisation (e.g. expectation of injury when exercising)	in vivo exposure*
a passive coping style, catastrophisation (e.g. helplessness/powerlessness)	graded activity, cognitive behavioural therapy (including Acceptance and Commitment Therapy [ACT]), motivational interviewing
psychological and psychosocial stress (trouble relaxing)	relaxation therapy
psychological and psychosocial stress (medical shopping, wanting to maintain control, frustration)	cognitive behavioural therapy (including Acceptance and Commitment Therapy), motivational interviewing

* In vivo exposure is only applicable for challenging cognitions; if you are unable to challenge a certain thought (e.g.: 'I'm afraid of ending up in a wheelchair' or 'The pain will never go away'), then in vivo exposure is not possible.

Discuss the choice of behaviour-oriented treatment with the patient and align with the patient's needs, preferences and capabilities and your own knowledge and skills as a therapist.

Only apply the forms of behaviour-oriented treatment for which you are competent and authorised[c].

C.4 Non-exercise therapy interventions

C.4.1 Mobilisations and manipulations

This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

[c] The psychosomatic physical therapist and exercise therapist has (among other things) expertise in applying interventions in patients with dysfunctional opinions about illness and/or illness behaviour and psychological disorders (such as depression or anxiety) with a negative impact on movement-related functioning.

For profiles 2 and 3, consider performing mobilisations[d] and/or manipulations[e] on patients with low back pain, but only as a supplement to exercise therapy if the problem is mechanical in nature due to disorders within the neuromusculoskeletal system (e.g. decreased regional mobility during lumbar flexion or extension).

Evaluate and analyse the effects of mobilisations and/or manipulations immediately within the treatment session and at the start of the next session. Be alert to serious (rare) adverse effects, such as significant increase of pain, motor deficit or fractures.

Discuss the choice of mobilisation or manipulation with the patient and align with the patient's needs, preferences and capabilities and your own knowledge and skills as a therapist. When doing so, pay attention to potential negative effects and discuss this with the patient prior to the treatment.

Do not perform mobilisations or manipulations:

- as singular intervention;
- if you are not competent and authorised to do this or you have insufficient knowledge to determine the indication and contra-indications;
- on patients in profile 1.

It is preferable not to perform mobilisations or manipulations on patients with LRS.

C.4.2 Massage

> This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

Do not apply massage:

- as singular intervention, or
- on patients who are highly dependent on the therapist, or
- on patients who are not open to a discussion about active and/or behaviour-oriented treatment, or
- on patients in profile 1, or
- on patients with LRS.

Only consider applying massage if there is increased muscle tension of the musculature surrounding the lumbar spine and you don't have immediate success in having the patient

[d] Mobilisations are understood to mean passive arthrogenic mobilisations.
[e] Manipulations are understood to mean high-velocity-thrust techniques on synovial joints.

conform to an active approach as a result of a strong preference for massage or strong expectations or convictions regarding massage.
But only:

- if you assess, in your capacity as a therapist, that there is a connection between the increased muscle tension and the complaints, and
- if a decrease of the increased muscle tension is necessary in order to achieve an active approach, and
- to create acceptance of an active approach and achieve exercise and self-reliance on the part of the patient, and
- if massage is a part of a more extensive approach, so in combination with active and/or behaviour-oriented treatment, and
- if massage is only used for a brief period of time, and
- the patient has been assigned to profile 2 or 3.

C.4.3 Transcutaneous electrical nerve stimulation (TENS) and interference

> This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

Do not apply TENS to patients with low back pain or LRS.

Do not apply interference to patients with low back pain or LRS.

C.5 Completion of the treatment

Stop criteria
Stop the therapy (prematurely):

- if the patient's need for assistance has been fulfilled; and/or
- if the therapeutic treatment goal(s) have been achieved; and/or
- if no or inadequate alleviation of the complaints has been achieved during evaluations as described in B.2 'Indications and treatment profiles' without a clear explanation. Using a measurement instrument for evaluation (see B.3 'Measurement instruments') can be useful, although is not guiding; and/or
- if the patient is sufficiently able to maintain or further improve his/her learned skills by himself or herself; and/or
- if the patient, regardless of the complaints, is not motivated to take responsibility him/herself for the complaints; and/or
- if there is a red flag or a feeling that something is not right; and/or
- if the patient indicates wanting to stop.

Follow-up care

Encourage the patient to continue exercising and moving independently after the treatment period. Schedule several follow-up sessions for this, for example.

Repeat the information and advice on self-management for recovery, active coping strategies, positive emotions and a healthy lifestyle and explain again that these can expedite recovery (see C.1 'Information and advice and (pain) education').

Repeat the information and advice about which influenceable factors may contribute to the onset of new episodes of low back pain (see A.2.4 'Etiological and prognostic factors').

Information exchange with the referrer

Send a report to the general practitioner or referrer at the start and end of the treatment.

Send an interim update:

- as a response to a request for information from the physician;
- as a response to a consultation request from the physician.

Consider sending an interim update:

- upon initial contact with the patient when he/she is referred;
- if the paramedical professional needs (more) information from the general practitioner;
- if the patient remains under treatment for a long time or in the event of an abnormal course: reporting on the chosen course at fixed times.

Draft reports and final reports according to the current Guideline on Information Exchange between General Practitioner and Paramedical Professional (HASP-paramedicus), the KNGF Guideline on Physiotherapeutic File-keeping and the VvOCM Guideline on File-keeping.

Explanation

Note A.1 Introduction

The Practice Guideline explains the reason for and the objective of this guideline revision.
This section of the guideline contains an explanation of the System Advice 2016 and the most important terms in this guideline.
The KNGF Guideline on Low Back Pain was developed in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019). The Justification describes how this methodology was applied to this specific guideline.

System Advice

In 2016 the Healthcare Institute of the Netherlands (Zorginstituut Nederland [ZiN]) issued the System Advice 2016 to the Minister of Health, Welfare and Sport to change the way of determining physical therapy and exercise therapy claims with regard to the fee structure (Healthcare Institute of the Netherlands 2016). The most important reason for this was that current claims result in patients/insured parties opting for more expensive types of healthcare that are fully reimbursed. The Minister adopted this advice in part, and stresses that experimentation should take place in particular with regard to conditions where physical therapy and exercise therapy offer a good chance of substitution (replacing expensive healthcare with inexpensive care with comparable effectiveness). The ZiN determined priorities within the framework of the advice implementation. Low back pain is one of these conditions. A report showed that there is a lot of evidence for the effectiveness of physical therapy and exercise therapy and that there are indications for the possibility of substitution (Ecorys 2020).
Part of the ZiN's advice is also that there must be guidelines for the respective conditions that comply with the Assessment Framework (Healthcare Institute of the Netherlands 2021b).
Within the framework of the System Advice, development of this guideline was co-financed by the Ministry of Health, Welfare and Sport – in addition to the financing from the KNGF and the VvOCM.

Target group

The KNGF Guideline on Low Back Pain must be followed for patients with low back pain as primary complaint. Low back pain is defined as pain between the lowest ribs and the buttock folds, possibly with sciatica into the leg. The pain can be continuously present or occur in episodes and can worsen with certain postures, movements and lifting or moving loads. Low back pain may be accompanied by sciatica into one or both buttocks and/or legs. If the sciatica is radicular in nature, then this is lumbosacral radicular syndrome (LRS).
The current guideline applies to patients with all forms of low back pain with or without (radicular) sciatica. This is in accordance with the most recent international guidelines for low back pain, to which high methodological quality has been attributed (De Campos 2017; Van Wambeke 2017).
The current guideline does not apply to patients with radicular sciatica accompanied by severe neurological disorders such as cauda equina syndrome or patients with neurological symptoms such as severe motor deficit (Medical Research Council score ≤ 3/5).
The current guideline also does not apply to patients with a suspected rare cause of the back pain, such as foraminal stenosis, spondylolisthesis, vertebral fracture, spinal metastasis, epidural abscess or hematoma or inflammation of a nerve root (radiculitis), for example caused by Borrelia

burgdorferi or herpes zoster. Screening is done for these conditions based on red flags (see B.1.3 'Red flags'). If a serious rare cause is suspected, the patient is referred to the general practitioner (Schaafstra 2015).
The current guideline does not apply to persons with low back pain who are 16 years of age or younger, coccygodynia (tailbone pain), referred low back pain or pelvic pain stemming from visceral problems, complaints that could be related directly to a surgical procedure or pregnancy-related back pain. The KNGF Guideline on Pregnancy-Related Pelvic Pain (KNGF 2009) applies to the last-mentioned complaints.

Changes compared to the previous KNGF Guideline on Low Back Pain

In the KNGF guideline from 2013, a differentiation is made between non-specific and specific low back pain. Non-specific low back pain is defined in the 2013 guideline as back pain (possibly with sciatica into the leg) for which no specific physical cause can be validly demonstrated, and specific low back pain is defined as low back pain with a specific physical cause that must be determined with additional diagnostics, such as a hernia of a lumbar disc (osteoporotic) spinal fractures, malignancy, ankylosing spondylitis, severe forms of canal stenosis or severe forms of spondylolisthesis (KNGF 2013). LRS could point to specific low back pain and therefore fell outside the scope of the 2013 KNGF guideline.
During the barrier analysis for revising the 2013 KNGF guideline which took place in 2018, physical therapists and exercise therapists indicated that when dealing with sciatica it is often unclear whether this is referred pain – whereby treating the patient is within the scope of the guideline – or radicular complaints – whereby the patient should not be treated according to the guideline. They also indicated that there was a need for specific recommendations for LRS, in line with the guideline of the Dutch College of General Practitioners, the NHG Standard on Lumbosacral Radicular Syndrome from 2015. The NHG Standard recommends that general practitioners be alert to an abnormal course and to emergency referral indications in patients with LRS, but that – if possible – conservative treatment consisting of information and advice, an activating approach and, if there is an indication for it, exercise therapy or pain medication, may suffice (Schaafstra 2015).
The guideline panel is therefore of the opinion that patients with (radicular) sciatica into the leg for whom referral to the general practitioner is not necessary can be treated according to the current guideline. Situations where it is necessary to refer patients with (radicular) sciatica into the leg to the general practitioner are described in specific recommendations.
Within the current guideline it was decided that abnormalities on imaging exams would not be guiding for including or excluding patients for this guideline, because the correlation between abnormalities on imaging exams and the complaints experienced by the patients is weak. Joint degeneration and disc hernias that were shown by imaging exams are often also seen in people without symptoms, making it unclear when one can speak of specific pain (Brinjikji 2015). In addition, there is proof that in an open population, degenerative abnormalities on an MRI are not or barely relevant as a grounds for predicting the degree of low back pain in the future (Kasch 2021).

Most important definitions and terms

Lumbosacral radicular syndrome (LRS). Pain in the buttocks and/or sciatica into a leg, accompanied by one or more complaints or symptoms suggestive of a condition of a specific lumbosacral nerve root, such as tingling sensations (paraesthesia) and neurological loss of function (hypoesthesia/hypoalgesia, paresis, diminished reflexes) (Schaafstra 2015).

- **Lumbar spinal canal stenosis.** Narrowing in the lumbar spinal canal, usually as a result of degenerative changes of the bony parts and soft tissue of the spine, which can lead to compression of one or more nerve roots and the dural sac (Schaafstra 2015).
- **Cauda equina syndrome.** (Unilateral or bilateral) motor or sensory deficit (saddle anaesthesia), alone or in combination with severe radicular pain, urine retention, incontinence for urine and/or faeces as a result of the compression of multiple sacral nerve roots (Schaafstra 2015).
- **Vascular claudication.** Exertion-related leg pain of vascular origin. Characterised by a cramp-like pain or numb feeling in the calves, but possibly also in the thighs or buttocks, which disappears in minutes when the person is at rest. The complaints may worsen to include pain even when at rest.
- **Neurogenic intermittent claudication (Verbiest syndrome).** A condition caused by the narrowing of the lumbar spinal canal (canal stenosis), characterised by sciatica, numbness and/or loss of strength in one or both legs and/or saddle numbness that occurs when standing or walking and disappear when sitting or bending over (Schaafstra 2015).
- **Radicular pain.** Lumbosacral sciatica running along one or more dermatomes. There is currently no consensus about the correct dermatome map. This can also concern sensitisation with expansion of pain in multiple dermatomes (Netherlands Society for Neurology 2020).
- **Universal prevention.** Prevention aimed at the healthy population (or parts thereof) which actively promotes and protects the health of the population, such as measures put in place for monitoring the quality of potable water and the National Vaccination Programme of the Netherlands.
- **Selective prevention.** Prevention aimed at population groups with an increased risk of disease in order to prevent people with one or more risk factors (determinants) for a specific condition from actually becoming ill, such as the flu shot for the elderly or the breast cancer population study.
- **Indicated prevention.** Prevention that is aimed at people with initial complaints and that prevents these initial complaints from exacerbating into a condition, such as an exercise programme for people with low back pain or an online group course for young people who have symptoms of depression.
- **Healthcare-related prevention.** Prevention that is aimed at people with an illness or condition and that prevents an existing disease from leading to complications, limitations, a lower quality of life or death, such as a stop smoking programme for patients with COPD, chronic bronchitis or pulmonary emphysema or a Combined Lifestyle Intervention (CLI) for a patient with obesity.

Note A.2.1 Epidemiology, pathophysiology and co-morbidity

Epidemiology

Low back pain is quite prevalent and has major consequences for the person with low back pain and for society. Among the conditions that cause the greatest disease burden, spinal column problems were ranked number eight in the Dutch population in 2015, and low back pain was even in first place worldwide in 2017 (Collaborators 2018). Low back pain occurs in all age groups, increases with age and has the highest prevalence between ages 40 and 80 (Hoy 2012). Studies report big differences in incidence and prevalence numbers due to differences in studied populations, measuring methods employed and definitions. In high-income countries, the one-year prevalence for adults is estimated to be 1.4% to 20% and the life-time prevalence 50% to 80% (Fatoye 2019; Rubin 2007). The life-time prevalence for youths up to 18 years of age is somewhat lower and is estimated to be between 36% and 65% (Calvo-Munoz 2013). Hoy (2012) states that the prevalence

of low back pain decreases between ages 80 and 89, but this decrease may be caused by the fact that this age group experiences more other problems and low back pain is underreported. In Dutch general practices, slightly fewer than 900,000 new cases of low back pain with or without sciatica occurred in 2019, with acute complaints being counted over and over again. The ratio of men to women was 45% to 55% and the ratio of no sciatica to sciatica was 70% to 30% (Volksgezondheidenzorg). The actual number of new cases is higher because some of the patients are not seen by the general practitioner; they go straight to another healthcare provider or don't seek care. For example, many patients see a physical therapist without the intervention of a general practitioner or medical specialist. In 2019 the percentage of treatment episodes of people who saw a physical therapist was 72%, and that was 4% higher than in 2018 (Van den Dool 2021). Patients with low back complaints make up an important part of the total number of patients who go to physical therapy and exercise therapy practices with health problems. In 2019, 10.3% of patients from Dutch physical therapy practices were coded under muscle, tendon and fascia conditions of the lumbar and lumbosacral spine, DCSPH code 3426 and 3526 (Van den Dool 2021). However, this seems to be an underestimate of the actual number of patients with low back pain in physical therapy practices, because physical therapists likely also register patients with low back pain under different codes, such as DCSPH-code 3626 for muscle, tendon and fascia conditions of the sacrum and the SI joints. The prevalence of LRS is a lot lower than the prevalence of low back pain. The one-year prevalence for adults is estimated to be 1% to 5% and the life-time prevalence 13% to 40% (De Campos 2017). Spijker-Huiges found a one-year prevalence of 1.7% at Dutch general practices (Spijker-Huiges 2015). The incidence of LRS is more closely related to age than low back pain: the incidence is almost zero for people under the age of 20, is highest for people aged 40 to 50 and then decreases again (De Campos 2017). The chance of a serious cause of low back pain, other than LRS, is low. In a large observational cohort (n = 1172) in Australia of employees working in the primary care setting, 0.9% of people with acute low back pain (<2 weeks) had a specific cause, including fractures (n = 8), cauda equina syndrome (n = 1) and inflammation (n = 2) (Henschke 2009).

Pathophysiology

Many different structures can be held responsible for the cause of low back pain, including the lumbar disc, facet joints, modic changes, lumbar muscles or nerves. Valid methods for pointing to specific structures as the source of the pain are lacking, however, and in approximately 90% of people with low back pain an underlying pathology cannot be demonstrated (Henschke 2009; Premkumar 2018). Pain is an individual perception and is complex. For example, pain may be present without any demonstrable abnormalities, and people may have demonstrable abnormalities without pain. Brinjikji, who studied 3,110 asymptomatic people, found disc degeneration in imaging exams in 37% of the 20-year-olds and 96% of the 80-year-olds (Brinjikji 2015). Bulging discs were visible in 30% of the 20-year-olds and 84% of the 80-year-olds, and disc protrusions in 29% and 43%, respectively (Brinjikji 2015). Kasch also found no clinically relevant associations between degenerative abnormalities (individually or in combination) and low back pain in 3,369 persons in an open population (Kasch 2021).

Low back pain is currently deemed to be a multidimensional experience with somatosensory, affective and cognitive components. It has been shown, for example, that there is a correlation between low back pain and morphological changes in the brain and increased activity in the so-called pain matrix (Nijs 2017). Some patients with low back pain have central sensitisation or nociplastic pain (Nijs 2015). Nociplastic pain entails disrupted pain-modulating processes in the central nervous system, including insufficiency of neural inhibiting systems and increased

activity of pain-facilitating systems (Nijs 2015, 2021). In addition to disrupted pain processes and biomechanical disruptions, lifestyle, co-morbidity, psychological, social and genetic factors also play a role (O'Sullivan 2012; Vlaeyen 2018). Knowledge of the factors associated with the onset of low back pain and with the transition from acute to chronic low back pain is increasing. Regardless, many of the mechanisms that are at the root of (chronic) low back pain are still not very well understood, it is unclear which factors are the cause or consequence of low back pain and the extent of recovery from the complaints is difficult to predict. (Hartvigsen 2018; Kent 2008). Low back pain is a multidimensional challenge for the healthcare provider.
In a large number of cases, the radicular pain is dominant over the low back pain, and a number of patients only experience pain in the leg. In most case, lumbosacral radicular syndrome (LRS) is caused by a lumbar hernia (Netherlands Society for Neurology 2020). In 90% to 98% of cases, the hernia is located at L4-L5 or L5-S1 (Volksgezondheidenzorg.info). However, a golden standard for determining LRS is lacking, and in about one-third of patients with an LRS diagnosis, no root compression can be seen on the MRI scan (Netherlands Society for Neurology 2020).

Co-morbidity

Co-morbidity often occurs in patients with low back pain (Von Korff 2005). From the various studies emerge conditions such as asthma, diabetes, headache, osteoarthritis, osteoporosis and cardiovascular problems (Beales 2012; Chou 2013; De Luca 2017; Ferreira 2013; Gore 2012; Hartvigsen 2018; Hestbaek 2003; Schneider 2007). Pelvic floor problems also frequently occur in patients with low back pain (Welk 2020). Co-morbidity results in increased use of care and has a negative effect on the prognosis of low back pain and can have consequences for how treatment is applied. There is as yet little clarity about the exact nature of the correlations between co-morbidity and low back pain (Hartvigsen 2018; Hestbaek 2003).

Note A.2.2 Societal impact

Low back pain is the number one cause worldwide for living with a limitation. Between 1990 and 2007, the number of years lived with limitations as a result of low back pain increased by 30% (with a range of 28-32%) (GBD 2017 Disease Injury Incidence Prevalence Collaborators 2018). Most people with low back pain have a low level of limitations. However, the high prevalence of low back pain in combination with a high degree of limitations in a small minority of the cases causes a very large societal impact (Hartvigsen 2018). The overall higher worldwide impact of low back pain can be almost entirely blamed on population increase and aging, given that the prevalence does not appear to be increasing (Hoy 2010). Limitations as a result of low back pain are highest in the 25- to 65-year-old labour force (Hartvigsen 2018).
The costs of low back pain are generally reported as medical costs (healthcare) and non-medical costs (absence from work or loss of productivity). Other non-medical costs, such as those for transportation to appointments, visits to complementary and alternative doctors and informal assistance not documented by the healthcare system are usually not reported. This means that most studies underestimate the total societal costs of low back pain.
The Dutch National Institute for Public Health and the Environment reports that the medical costs in the Netherlands for neck and back complaints amounted to EUR 937 million in 2017 (Volksgezondheidenzorg.info). This equates to 14% of the total healthcare costs incurred in that year for musculoskeletal system and connective tissue disorders and 1.07% of the total costs of healthcare in the Netherlands. Of the costs for neck and back complaints, 62% was spent on

hospital care, 12% on primary care and 11% on other providers. Compared to 2017, the medical costs in the Netherlands for neck and back complaints were higher in 2011 (EUR 1.3 billion) and percentage-wise there were lower costs for hospital care (38%) and higher costs for primary care (29%) (Volksgezondheidenzorg.info).
In a study by Lambeek on the medical expenses, relevant data were collected from national registers, reports by research institutes, descriptive studies and occupational healthcare (Lambeek 2011). The goal of this study was to estimate the total costs of back pain for Dutch society for the years 2002-2007 based on medical and non-medical costs for low back pain (Lambeek 2011). The total societal costs of back pain decreased from EUR 4.3 in 1991 to EUR 3.5 million in 2007 (Lambeek 2011). These costs made up about 0.9% of the gross domestic product (GDP) in 2002 and 0.6% of the GDP in 2007. The ratio of medical costs to non-medical costs has not changed markedly over the course of the years, being 12% for medical costs and 88% for non-medical costs. The decrease in costs in the period from 1991 to 2007 seems to have been primarily the result of a change in the law on disability pensions and implementation of evidence-based healthcare (Lambeek 2011).

Note A.2.3 Clinical presentation and course

An episode of low back pain can start slowly or acutely due to physical factors (e.g. due to lifting an object or making an (un)usual movement), psychosocial factors (e.g., fatigue or stress) or a combination of these two (e.g. being distracted when lifting) (Steffens 2015). The percentage of people with acute onset of low back pain is estimated to be 17% to 59% (Henschke 2009; Macfarlane 1999). Approximately 30% of people cannot remember a cause (Do Carmo Silva Parreira 2015). During the first four to six weeks most people recover and pain and physical functioning improve by an average of 25%-60% (Menezes Costa 2012; Pengel 2003). After a month 20% to 40% of people have recovered completely and after three months 33%-74% (Abbott 2002; Chou 2010; Itz 2013; Scheele 2012). The recovery flattens out after three months. The percentage of people who recover completely after three to 12 months is estimated to be 35% and 75% (Abbott 2002; Chou 2010; Scheele 2012). After 12 months, the percentage of people who still have complaints remains more or less stable (Kaaria 2010; Lemeunier 2012).
The numbers regarding resumption of work are more favourable than those for pain and physical functioning. Resumption of work after one, three, six and 12 months is estimated to be 63% to 82%, 80% to 95%, 84% to 98% and 89% to 98%, respectively (Andersson 1999; Chou 2010; Hestbaek 2003; Pengel 2003).
Relapses of low back pain occur frequently. One to two in three people have a relapse within one year of recovery from a previous episode (Da Silva 2017; Stanton 2008). The reported results about recovery and relapses are rather divergent because different definitions for recovery are used in the various studies, and there is a big variation of inclusion criteria, patient populations and measurement instruments employed.
The extent of recovery appears to differ little in an open population (general population where people with complaints do or don't seek help from a healthcare professional) compared to a population in a primary care setting (Lemeunier 2012). In the secondary and tertiary care setting, in which the population is characterised by a higher degree of limitations on physical and mental functioning, the baseline situation for recovery is less favourable than in the primary care setting or in an open population. Pain reduction and increased physical functioning after one year is hence estimated in the secondary and tertiary care setting to be just 30% and work resumption 50% (Verkerk 2013; Verkerk 2015a, Verkerk 2015b).

Low back pain is considered to be a dynamic condition whereby episodes of little to no back pain alternate with episodes of moderate to severe back pain (Axén 2013; Hartvigsen 2018).
The typical clinical picture of lumbosacral radicular syndrome (LRS) is severe, sharp, shooting pain, with the distribution of pain and/or paraesthesia running along a specific dermatome. Because roots L5 or S1 are injured in most cases, the pain usually radiates out to under the knee. The pain is often more severe in the leg than in the back, can get worse during moments of increased pressure and generally abates when lying down (Netherlands Society for Neurology 2020; Schaafstra 2015).
The short-term and long-term prognosis for low back pain with sciatica into the leg is less favourable than for low back pain without sciatica into the leg (see also A.2.4 'Etiological and prognostic factors') (Dunn 2004; Hartvigsen 2017; Hill 2011; Tubach 2004). For patients with sciatica with or without the characteristics of LRS, the recovery percentage after one year is estimated to be between 44% and 65% (Hartvigsen 2017; Haugen 2012; Iversen 2015; Konstantinou 2018; Tubach 2004). The variation depends, among other things, on the definition of recovery, the treatment plan and whether the selection of the patients took place in the primary or secondary care setting. Of all patients who consult a general practitioner due to problems with the low back with sciatica, 16% are referred to secondary care. For patients with low back pain without sciatica this number is 8% (Flinterman 2019).

Note A.2.4 Etiological and prognostic factors

Reason

Much research has been conducted in recent years on etiological and prognostic factors of low back pain, necessitating revision of the factors described in the 2013 KNGF guideline (KNGF 2013).

Clinical question

Which etiological and prognostic factors are recommended to analyse during the medical history taking and the physical examination?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. Existing systematic reviews of prospective cohort studies, possibly in combination with cross-sectional and case control studies, were selected. The results were analysed in a narrative manner and descriptively incorporated.
The etiological and prognostic factors that were eligible to be included in the guideline were selected based on the consensus of the guideline panel, with the following components being assessed: the quality of the evidence that is related to the scope of the studied population and the consistency of the burden of proof, the degree of the effect and the applicability and/or clinical relevance of the factor.

Conclusions based on the literature

The Justification contains the details based on which these literature conclusions were drawn.

Etiological factors

Based on 13 systematic reviews, the usability of 14 etiological factors was evaluated (Campbell 2013; Da Silva 2017; Ferreira 2013; Heneweer 2011; Hestbaek 2003; Janwantanakul 2012; Lang 2012; Pinheiro 2016; Shiri 2016; Shiri 2010ab; Taylor 2014; Zhang 2018). The following risk factors of the onset of first-time back pain or recurring back pain were selected to be included in the guideline based on consensus: previous episodes of low back pain, overweight and obesity, smoking, co-morbidity, depression, a high degree of physical load at work, a high degree of mental stress at work, little social support at work, few options to independently fulfil work tasks, little job security and very monotonous work.
Although there is a suspicion that etiological factors influence the onset of low back pain, etiological factors are not by definition causal factors.

Prognostic factors

Based on 14 systematic reviews, the usability of 26 prognostic factors was evaluated (Campbell 2013; Chou 2010; Hallegraeff 2012; Hayden 2009; 2010; Hendrick 2011; Kent 2008, Oliveira 2019; Pinheiro 2016; Ramond 2011; Steenstra 2017; Verkerk 2012; Wertli 2014ab). The selected prognostic factors are divided into four domains: 'factors related to back pain', 'patient-related factors', 'psychosocial factors' and 'work-related factors'. The following prognostic factors were selected to be included in the guideline based on consensus: 'previous episodes of low back pain', 'high degree of limitations in activities', 'pain in the leg or sciatica', 'high intensity of pain', 'bad general health or quality of life', 'psychological and psychosocial stress' ('distress'), 'pain-related fear of movement', 'feelings/symptoms of depression', 'passive coping', 'negative expectations about recovery or catastrophisation', 'high degree of physical load at work', 'bad relationships with colleagues', and 'diminished job satisfaction'. The results of the included systematic reviews are often conflicting, and the connection between the prognostic factor and persistent low back pain is often weak.

Conclusions based on the considerations

The Justification contains the details based on which these conclusions of the other considerations were drawn.
Although lots of systematic review was carried out on etiological and prognostic factors of low back pain, there is still uncertainty about the value of this for daily practice. The results of systematic reviews are often conflicting.
Some systematic reviews report statistically significant associations of patient-related etiological or prognostic factors; however, the clinical relevance of these associations appears to be limited. In addition, uncertainty remains about the reliability of the conclusions as a result of methodological limitations in the literature about the prognostic factors of low back pain (Hayden 2009). The studied populations, the operationalisation of the risk factors and the outcome measures are very heterogeneous. The associations are also often weak. The named factors play a role in the onset or course of back complaints, but not a single one of those factors has a very strong association with back complaints. Treating only one factor will not eliminate the back complaints but might decrease them.
A recently published overview article of systematic reviews identified seven prognostic factors in patients with neck and low back pain: limitations in activities, mental health, pain intensity, severity of the pain, coping, expectations regarding recovery and pain-related fear of movement (Mansell 2021). There was reasonable confidence that the association is robust (based on

consistency of proof between the included studies and the risk of bias) for these factors. These factors are in line with the prognostic factors for delayed recovery that we identified.
The guideline panel believes that a strong recommendation regarding analysis of the etiological factors is in order given the small amount of effort needed to analyse the factors during the medical history taking and the possible value of those factors in the clinical decision-making process. Information about the etiological factors can be used to provide targeted information and advice.
The guideline panel also has a strong recommendation regarding the prognostic factors, because the prognostic factors play an important role in evaluating the risk of persistent complaints. The acquired information is important within the scope of the clinical decision-making process, in shaping the therapy or when referring patients to other (para)medical professionals. For example: a company physician or an occupational therapist in the case of work-related factors and a psychologist or psychosomatic physical therapist or exercise therapist for psychosocial factors.
The guideline panel realises that the overview of the prognostic factors is not exhaustive and therefore finds it important to apply the clinical expertise of the practicing physical therapist or exercise therapist in order to identify other prognostic factors (related or not related to back pain) during the diagnostic process and to use these in evaluating the risk of persistent complaints. These may be prognostic factors that can promote recovery (such as getting the recommended amount of exercise and a healthy lifestyle) or ones that can impede recovery (such as pain elsewhere in the body and decreased capacity as a result of co-morbidity).

Note A.3 Organisation of healthcare

Gradual approach

Patients with low back pain are treated by a large group of (para)medical professionals. The same gradual approach is used for the organisation of care as the one described for the Chronic Pain Healthcare Standard (Perez 2017).

Prevention (step 1)

Universal prevention is not part of the primary discipline of the physical therapist and exercise therapist, nor is selective prevention. However, the physical therapist or exercise therapist can play a signalling role within selective prevention (KNGF 2021). Indicated prevention and healthcare-related prevention are part of the discipline of the physical therapist and exercise therapist.

Monodisciplinary diagnosis and treatment in the primary care setting (step 2)

The general practitioner may decide to oversee the patient him/herself or refer the patient to a wide range of (para)medical professionals for treatment and/or further diagnosis.

Multidisciplinary diagnosis and treatment in the primary care setting in close collaboration with the secondary care setting (step 3)

Multidisciplinary diagnosis and treatment can take place in the primary care setting, possibly in collaboration with the secondary care setting, and – in the case of more serious problems – can be 'scaled up' to multidisciplinary diagnosis and treatment in the secondary or tertiary care setting (De Jong 2018; Perez 2017). Pain education is an important aspect of the multidisciplinary treatment programme.

The quality of the healthcare and the organisational level of multidisciplinary collaboration in the primary care setting in the Netherlands varies greatly, and in many cases there is room for improvement (Van Tulder 2010; Healthcare Institute of the Netherlands 2018). The Sequenced Healthcare Guideline on Non-specific Low Back Pain (Van Tulder 2010), as well as the NHG Standard on Non-specific Low Back Pain (NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017) and the Chronic Pain Healthcare Standard (Perez 2017) contain recommendations on multidisciplinary collaboration and communication. However, implementation of these recommendations is still lagging. In 2021, the Healthcare Institute of the Netherlands produced a report describing several remedial actions for better coordination of the healthcare in the entire chain (Healthcare Institute of the Netherlands 2021).
The guideline panel recognises that it is important to make local or regional agreements about multidisciplinary collaboration for patients with low back pain. The guideline panel also believes that hiring a coordinator can contribute to the quality of healthcare. This is why the recommendation was made for physical therapists and exercise therapists to coordinate the organisation of this care with the healthcare providers at the local and regional level and to appoint a coordinator for this in mutual consultation.

Multidisciplinary treatment in the secondary care or tertiary care setting (step 4)

Complex problems are understood to mean: long-term (>12 weeks) absence from work, multiple simultaneous health problems (co-morbidity), a high disease burden, severe and untenable pain and the presence of dominant, recovery-impeding psychosocial factors (Netherlands Pain Recovery Guideline Panel 2017). Care in the secondary or tertiary care setting is only useful if the patient is intrinsically motivated to view the complaints from a biopsychosocial perspective and change recovery-impeding behaviour (NHG Guideline Panel for the NHG Standard on Non-specific Low Back Pain 2017).
Specialised medical rehabilitation for people with chronic low back pain usually takes place in the secondary or tertiary care setting and generally focuses primarily on the consequences of the low back pain and not on treating the pain. Healthcare in the secondary care setting takes place at rehabilitation centres, at hospital rehabilitation departments and at independent treatment centres. Tertiary care is very specialised, intramural rehabilitation care.

Collaboration

This guideline explains how collaboration can be organised so that this collaboration is effective and efficient. The guideline focuses primarily on describing what high-quality healthcare is and provides guidance – where possible based on the content – on the way that this care can be organised.
No criteria have been formulated regarding the moment at which a patient should be referred to a specialised physical therapist or exercise therapist. There is no consensus about this. The competencies of general physical therapists and exercise therapists and physical therapists and exercise therapists with a specialisation or special certification are described in the professional profiles. It is important for physical therapists and exercise therapists to have knowledge of and insight into the expertise of both the (para)medical professionals who are involved in the treatment of low back pain as well as the specialised physical therapists and exercise therapists and physical therapists with special certification (KNGF 2021).
Physical therapists and exercise therapists are specialised in the musculoskeletal system. They treat patients through Direct Accessibility to Physical Therapy (DAPT) or Direct Accessibility to Exercise Therapy (DAET) or by referral from general practitioners or medical specialists.

Therapists with specialisations such as manual therapy, psychosomatic physical therapy or exercise therapy, pelvic physical therapy or exercise therapy, sports physical therapy and company physical therapy and occupational therapy have specific expertise in diagnosing and treating low back pain. For all these specialisations, the goal of the treatment is maintenance or recovery of daily functioning. However, the manner of treatment can vary for each specialisation.
Below is a (non-exhaustive) list of the (para)medical professionals involved in low back pain.

Expertise of the involved (para)medical professionals

Physical therapist or exercise therapist

The physical therapist or exercise therapist (with or without specialisation) screens the patient for red flags, determines whether there are dysfunctions or recovery-impeding factors at play and documents the degree of the pain, limitations experienced and participation problems. Based on the findings, it is decided whether treatment is indicated and the treatment plan is determined (see B.2 'Indications and treatment profiles'). If there is no indication for treatment, then the therapist considers – in consultation with the patient – whether to refer the patient (back) to the general practitioner.
The role and position of the physical therapist and the exercise therapist in healthcare, i.e. the domain description, can be found in the professional profile of the physical therapist and the professional profile of the exercise therapist (KNGF 2014, 2021; VvOCM 2019b).
Below, the specialisations within physical therapy and exercise therapy are described whose specific expertise is recognised by the KNGF or the VvOCM, as described in the Professional Code for Physical Therapists and the Professional Code for Exercise Therapists. These specialisations are included in the Quality Register for Para(medical) Professionals (kwaliteitsregisterparamedici.nl), which ensures that these healthcare professionals maintain their knowledge and skills at a good level.

Manual therapist

The manual therapist is additionally trained in complex health problems concerning the neuromusculoskeletal system in which the spine and/or the extremities play a central role. During the diagnostic and therapeutic process, the manual therapist uses complex manual skills, including high-velocity-thrust techniques.
The professional profile describes the work of the manual therapist, as well as the context within which these take place and the competencies required for this (KNGF 2014).

Psychosomatic physical therapist or exercise therapist

Psychosomatic physical therapy or exercise therapy focuses on treating problems related to tension or stress and on misunderstood physical complaints. The psychosomatic physical therapist or exercise therapist includes physical, psychological and social aspects in the treatment, including living and working conditions.
The work of the psychosomatic physical therapist and exercise therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the psychosomatic physical therapist (KNGF 2009) and the psychosomatic exercise therapist (VvOCM 2018), respectively.

Pelvic physical therapist

Pelvic physical therapy focuses on people with health problems in the pelvic area (i.e. the pelvic belt with the pelvic floor muscles and the pelvic organs, the lumbar spine and the hips). This can be men, women or children of all ages with very diverse needs for assistance, such as incontinence for urine and/or faeces, constipation, dyspareunia (pain during sexual intercourse), prostate and prolapse problems. In addition to screening, diagnosis, prognosis and therapeutic interventions, the field focuses on prevention of pelvic and pelvic floor dysfunction. The pelvic physical therapist has to have specific competencies, including performing internal examination and treatment (KNGF 2014). The knowledge domains and competency areas of the pelvic physical therapist are described in the professional profile of the pelvic physical therapist (KNGF 2014).

Pelvic exercise therapist

The pelvic exercise therapist treats clients with (complicated) pelvic problems and/or pelvic floor problems (either pregnancy-related or not) and clients who are at risk of developing these problems. Common (complex) complaints and problems in this context include the following: complaints in the pelvic, low back and abdominal region (i.e. pelvic complaints, tailbone complaints, sacroiliac complaints, painful pubic bones, lumbosacral complaints, groin complaints, pseudoradicular complaints, pain in the pelvic floor, increased abdominal pressure/(lower)abdominal pain, etc.), pregnancy-related problems/complaints, urination and defecation problems, prolapse complaints, tension dysregulation, sexual problems and complaints due to a condition, e.g. a cerebrovascular accident (CVA), multiple sclerosis (MS), COPD, osteoarthritis and some forms of cancer and the consequences of cancer.
The work of the pelvic exercise therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the pelvic exercise therapist (VvOCM 2019a).

Sports physical therapist

The sports physical therapist is particularly focused on prevention, treatment, information and advice for everyone who wants to (resume) exercise. The sports physical therapist also focuses on patients with sports-related back complaints.
The work of the sports physical therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional competency profile of the sports physical therapist (KNGF 2018).

Company physical therapist and occupational therapist

The company physical therapist and occupational therapist focus on problems related to work. Some issues that are tackled are organisation of work (work tasks, times and pressure), the workplace and manner of working.
The occupational therapist works in a private practice or institution for healthcare and informs, advises and treats people with the goal of preventing complaints and absence from work.
In addition to physical therapy, the treatment may also consist of a (reintegration) training programme, instructional training in the workplace or a workplace assessment.
The company physical therapist has followed an occupational therapy differentiation and can work as a payroll employee or as an independent contractor in a private practice or healthcare institution, for a reintegration company, an occupational health and safety agency or for a company or consulting firm. The company physical therapist has been trained to improve

occupational health and safety services at the company level after having conducted thorough research. While the occupational therapist is primarily focused on the recovery possibilities of patients with work-related problems, the focus of the company physical therapist is primarily on the level of the workplace or organisation.
The work of the company physical therapist and occupational therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the company physical therapist and occupational therapist (KNGF 2009).

Geriatric physical therapist and geriatric exercise therapist

The geriatric physical therapist and geriatric exercise therapist are specialists in the physical functioning of vulnerable persons with multi-morbidity and with complex problems (with psychological and social factors also playing a role). They focus on physical functioning, with the goal of maintaining or recovering activities and participation; if necessary, they can work in a multidisciplinary team. They provide support if new health problems arise and give guidance in the event of deterioration during the aging process.
The work of the geriatric physical therapist and geriatric exercise therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional profiles of the geriatric physical therapist (KNGF 2015) and geriatric exercise therapist (VvOCM 2019b).

Expertise of other healthcare providers

Healthcare providers who are involved in the care of patients with low back pain as a consultant, main provider or co-provider are the general practitioner, general practice-based nurse specialist for mental healthcare, as well as the lifestyle coach, occupational therapist, psychologist, rehabilitation physician, rheumatologist, neurologist, neurosurgeon, orthopaedic surgeon, anaesthesiologist-pain specialist, company physician, insurance company physician and sports medicine physician.

General practitioner

The general practitioner screens the patient for warning signs and diagnoses, informs and coordinates the healthcare. The general practitioner can refer the patient for additional diagnostics or treatment to a wide range of healthcare providers in the primary, secondary and tertiary care setting. Referral takes place based on the nature of problems, the need for assistance, the patient's preference and the local availability and expertise of healthcare providers.
Recommendations for the diagnosis and treatment by the general practitioner for low back pain are described in the Standard on Non-specific Low Back Pain and the Standard on LRS by the Dutch College of General Practitioners (NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017; Schaafstra 2015).
The work of the general practitioner, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the general practitioner (Van de Vijver 2016).

Primary care assistant practitioner for mental healthcare (POH-GGZ)

The primary care assistant practitioner for mental healthcare (POH-GGZ) supports the general practitioner in providing guidance to patients with psychological, psychosomatic or psychosocial problems during their own surgery hours. The guidance consists of patient information and advice

and education about manner in which patients can deal with (the consequences of) their low back pain. In incidental cases, a home visit may also take place (POH-GGZ 2020 Position and Competency Profile Expert Group).
POH-GGZ is not (yet) a profession but a position. Different from a profession, a position refers to the execution of a set of related tasks.

Lifestyle coach

The lifestyle coach guides people in (re)taking control of their health and wellbeing. The lifestyle coach applies a biopsychosocial model and explicitly uses the definition of positive health. In positive health the focus is on resilience and personal empowerment and not on the illness. The approach of a lifestyle coach is based on guiding people in making their own choices. Lifestyle coaches are not healthcare professionals; they help everyone who wants to change their daily habits so they can (continue to) feel good.
The work of the lifestyle coach, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the lifestyle coach (Dutch Professional Association of Lifestyle Coaches 2016).

Occupational therapist

The occupational therapist focuses on improving execution of everyday activities, with the healthcare primarily being aimed at the patient's need for assistance. The need for assistance can be in the area of self-reliance, productivity, leisure activity, living situation and mobility. The occupational therapist evaluates the distribution between stress and capacity and whether postures and movements can be performed in an ergonomic and efficient manner.
The work of the occupational therapist, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the occupational therapist (Van Hartingsveldt 2010).

Psychologist

The psychologist diagnoses and treats people with psychological problems. Among the BIG-registered psychologists who deal with chronic pain are healthcare psychologists, clinical psychologists and psychologists who are BIG-registered psychotherapists. Methods often applied for patients with chronic low back pain are cognitive behavioural therapy, Acceptance Commitment Therapy and Eye Movement Desensitization and Reprocessing' (EMDR).
The work of healthcare psychologists, clinical psychologists and BIG-registered psychotherapists, as well as the context within which it takes place and the competencies required for this, are described in the professional profiles of the healthcare psychologist (Dutch Association for Healthcare Psychology 2017), the clinical psychologist (Dutch Association for Healthcare Psychology and the Dutch Association of Psychologists 2015) and the psychotherapist (Dutch Association of Psychotherapy 2007).

Rehabilitation physician

The rehabilitation physician focuses on eliminating, decreasing or, if possible, preventing the consequences of illnesses or conditions so that the patient can function and participate in society as best possible. For patients with low back pain, the rehabilitation physician can be consulted if: 1) the complaints are complex and long-term, 2) psychosocial factors delay recovery or 3) specific knowledge is needed in orthesiology, adjustments and facilities.

Rheumatologist

The rheumatologist treats patients with inflammatory rheumatism, systemic illnesses, metabolic-degenerative conditions and soft tissue rheumatism. The rheumatologist plays an important role in the treatment of specific low back pain, such as osteoporosis and axial spondyloarthritis (axial SpA).

Neurologist

The neurologist treats patients with conditions of the brain, the spinal cord, the nerves, the transition from the nerves to the muscles and muscle diseases. Compared to other secondary care medical specialists, the neurologist is consulted the most often by patients with low back pain, specifically in 53% of all referrals (Flinterman 2019). The neurologist is consulted when there is a suspicion of a radicular syndrome, radiculopathy, or radiculitis, spinal cord injury or cauda equina syndrome or conus-cauda syndrome. If the neurologist finds an indication for surgery, the patient is referred to a neurosurgeon or orthopaedist. In specific cases, the neurologist will refer the patient to an anaesthesiologist-pain specialist.
Recommendations for diagnosis and treatment by a neurologist for patients with low back pain are described in the Guideline on Lumbosacral Radicular Syndrome (Netherlands Society for Neurology 2020).

Neurosurgeon and orthopaedic surgeon

Neurosurgeons and orthopaedic surgeons each perform spinal surgery based on their own background and expertise, but there is extensive collaboration and overlap of activities. Spinal surgery is indicated for severe low back pain that has not responded to conservative treatment or complaints that are a serious threat to the patient's health. This can include low back pain due to tumours, vertebral fractures, lumbar hernias, spinal stenoses, deformities of the spine (scoliosis/kyphosis) and vertebral displacement (spondylolisthesis).
Recommendations for the indication and treatment of spinal surgery are described in the guidelines for instrumented spinal surgery (Dutch Orthopaedic Society 2017) and non-instrumented spinal surgery (Dutch Neurosurgical Society 2018).

Anaesthesiologist-pain specialist

The anaesthesiologist-pain specialist is primarily concerned with (severe) chronic pain. Anaesthesiological pain treatment techniques are primarily applied in patients with low back pain with sciatica, or for neurogenic back pain (Obradovic 2020). The anaesthesiologist-pain specialist is familiar with a variety of pain treatment techniques. The most frequently applied techniques are percutaneous thermolysis of the dorsal ganglion, lumbar epidural injections and neurolytic blockade of one or more peripheral nerves (Obradovic 2020). For patients with 'failed back surgery syndrome' (where leg pain is the focus), the anaesthesiologist-pain specialist can perform electrical stimulation of the spinal cord (neurostimulation or electric spinal epidural stimulation).

Company physician

The company physician assesses the stress and capacity of a sick employee in relation to his/her work and advises the employee and employer about this. The company physician does this based on his/her independent professional opinion. The company physician is co-responsible for verifying a risk identification and evaluation and looking after employees who are unable to perform their job.

The work of the company physician, as well as the context within which it takes place and the competencies required for this, are described in the professional profile of the company physician (Netherlands Society of Occupational Medicine 2004).
Recommendations for diagnosis and treatment of low back pain and LRS are described in the Guideline on Low Back Pain and Lumbosacral Radicular Syndrome for company physicians and insurance company physicians (Luites 2021).

Insurance company physician

The insurance company physician assesses, within the framework of the laws on incapacity for work, the capabilities and limitations of people who are (partially) unable to work as a result of illness or disability and are receiving benefits. These are people who don't have employment, have difficulty finding employment or are (partially) incapacitated for work. The insurance company physician examines the capacity in a broad perspective and advises and advises the patient about the opportunities on the entire labour market. The insurance company physician is also involved in absenteeism supervision and claim assessment. Recommendations for diagnosis and treatment of low back pain and LRS are described in the Guideline on Low Back Pain and Lumbosacral Radicular Syndrome for company physicians and insurance company physicians (Luites 2021).

Sports medicine physician

The sports medicine physician treats and advises patients in the area of stress and capacity in relation to sports and exercise. The sports medicine physician focuses on patients who are already playing sports or exercising but also patients who want to start playing sports or exercising.
The sports medicine physician can play a role in the diagnosis and treatment of back complaints that began due to or while playing sports or exercising, as well as in the advice to use sports as a means of treating back complaints. The sports medicine physician also focuses on the diagnosis and treatment of sports-specific back complaints, such as those in gymnastics or strength sports.

Note B.1.1 Medical history taking

Reason

In recent years, there have been developments in practice and based on the literature that required a revision of the recommendations regarding medical history taking as described in the 2013 KNGF guideline (KNGF 2013).

Clinical question

Which information is collected when taking the medical history of a patient with low back pain?

Method

When elaborating this clinical question, the abbreviated ICF Core Set for low back pain (formerly: Brief Core Sets for low back pain (Cieza 2004)) was used in consultation with the guideline panel. The recommendations were compiled using the mentioned literature (evidence) and clinical expertise, patient preferences, and values and preferences on the part of the members of the guideline panel and review panel (considerations). Together they determine the direction, strength and formulation of the recommendation.

Conclusions based on the literature

The relevant information that must be obtained during the medical history taking is assessed based on the International Classification of Functioning, Disability and Health (ICF) (Heerkens 2002).
For low back pain, an abbreviated ICF Core Set was developed by means of a literature review and a formal decision-making and consensus process by international experts with various backgrounds (Cieza 2004). This abbreviated ICF Core Set contains the most relevant aspects of the health problem for people with low back pain, classified according to the following domains: 'functions and anatomical characteristics', 'activities', 'participation', 'external factors' and 'personal factors'. The Core Set forms the basis for the medical history taking of patients with low back pain.
The ICF categories are included in the following table.

Diagram of the ICF categories for low back pain based on the Brief Core Sets for low back pain. Source: Cieza 2004

ICF component	ICF code	ICF category
Functions	b280	pain perception
	b152	mood
	b730	muscle strength
	b710	mobility of joints
	b455	exercise tolerance
	b134	sleep
	b740	muscle endurance
	b735	muscle tone
	b715	stability of joints
	b130	energy and drives
Anatomical characteristics	s120	spinal cord and related
	s760	torso
	s770	extra structures related to movement
Activities and participation	d415	maintaining body posture
	d430	lifting and carrying
	d410	changing basic body posture
	d450	walking
	d850	paid work
	d859	occupation and work, otherwise specified and unspecified
	d640	household chores
	d540	getting dressed

Activities and participation (continued)	d240	dealing with stress and other mental demands
	d760	family relationships
	d530	using the toilet
	d845	acquiring, keeping and stopping work
External factors	e580	facilities, systems and policy regarding healthcare
	e570	facilities, systems and policy regarding social security
	e355	professional caregivers
	e450	personal attitudes of professional caregivers
	e410	personal attitudes of immediate family members
	e135	products and technology for work purposes
	e110	products and substances for human consumption
	e310	immediate family
	e155	technical aspects of private buildings
	e550	facilities, systems and policy regarding legal issues

Conclusions based on the considerations

The items from the ICF Core Set were screened by the guideline panel for applicability to the medical history taking and supplemented by the information that is needed for identifying red flags and risk factors for the occurrence of low back pain and persistent complaints. In addition to the Core Set, the guideline panel also deems it important to ask about co-morbidity during the medical history taking.

In order to assess whether a patient has pelvic problems, the therapist can ask about urination, defecation and sexual problems. Pelvic problems occur both in men and women. These problems include unintentional loss of urine or faeces, constipation, pain and/or discomfort during sexual intercourse, pelvic pain and/or problems during or after pregnancy and a heavy or tired feeling from below. The therapist may use the Pelvic Floor Dysfunction Questionnaire (Hanemaaijer-Slottje 2019); however, there are as yet no known clinimetric properties known from this questionnaire. The Numeric Rating Scale (NRPS) is recommended for measuring functions and anatomical characteristics; the Patient-Specific Complaints (PSC) and the Quebec Back Pain Disability Scale (QBPDS) are recommended for measuring activities and for measuring participation again PSC (see B.3 'Measurement instruments').

Note B.1.2 Physical examination

Reason

In recent years, there have been developments in practice and based on the literature that required a revision of the recommendations regarding physical examination as described in the 2013 KNGF guideline (KNGF 2013).

Clinical question

Which information is collected during a physical examination of a patient with low back pain?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. When elaborating this clinical question, the abbreviated ICF Core Set for low back pain (formerly: Brief Core Sets for low back pain (Cieza 2004)) was used in consultation with the guideline panel. The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019).

Conclusions based on the literature

The range of clinical tests for physical examination of the low back is extensive and varied. For many clinical tests, the clinimetric aspects such as inter-rater reliability, predictive validity (content and construct validity) and prognostic value was insufficiently proven or not studied (Alqarni 2011; Cook 2011; Denteneer 2017; Hartvigsen 2015).
The physical examination of the low back in the present guideline is primarily based on the examination categories of the International Classification of Functioning, Disability and Health (ICF) (Delitto 2012; Heerkens 2002).

For low back pain, an abbreviated ICF Core Set was developed by means of a literature review and a formal decision-making and consensus process by international experts with various backgrounds (Cieza 2004). This abbreviated ICF Core Set contains the most relevant aspects of the health problem for people with low back pain. The ICF categories are included in the following table.

Diagram of the ICF categories of the abbreviated ICF Core Set for low back pain.
Source: Cieza 2004

ICF component	ICF code	ICF category
Functions	b280	pain perception
	b152	mood
	b730	muscle strength
	b710	mobility of joints
	b455	exercise tolerance
	b134	sleep
	b740	muscle endurance
	b735	muscle tone
	b715	stability of joints
	b130	energy and drives

Anatomical characteristics	s120	spinal cord and related
	s760	torso
	s770	extra structures related to movement
Activities and participation	d415	maintaining body posture
	d430	lifting and carrying
	d410	changing basic body posture
	d450	walking
	d850	paid work
	d859	occupation and work, otherwise specified and unspecified
	d640	household chores
	d540	getting dressed
	d240	dealing with stress and other mental demands
	d760	family relationships
	d530	using the toilet
	d845	acquiring, keeping and stopping work
External factors	e580	facilities, systems and policy regarding healthcare
	e570	facilities, systems and policy regarding social security
	e355	professional caregivers
	e450	personal attitudes of professional caregivers
	e410	personal attitudes of immediate family members
	e135	products and technology for work purposes
	e110	products and substances for human consumption
	e310	immediate family
	e155	technical aspects of private buildings
	e550	facilities, systems and policy regarding legal issues

Conclusions based on the considerations

The items from the ICF Core Set were screened by the guideline panel for applicability to the physical examination and supplemented by relevant information. e.g. for identifying red flags. An important goal of the physical examination is to evaluate and exclude underlying, serious conditions. If a serious condition is suspected based on the medical history taking, or in the event of doubt (a feeling of something not being right), then the patient can be specifically examined for this, unless it's not relevant. In the event of a feeling of something not being right (such

as a combination of warning signs stemming from the medical history taking and/or physical examination or low back pain in combination with a negative movement examination), there may not be an indication for physical therapy or exercise therapy, and the patient will be advised to contact the physician/general practitioner (see B.1.3 'Red flags').
For many clinical tests, the clinimetric properties and scientific substantiation are (very) limited. It is therefore impossible to recommend a single specific clinical test. The guideline panel therefore recommends a physical examination focused on various functions and activities in order to arrive at an initial hypothesis and treatment strategy, together with the findings from the medical history taking.

Lumbosacral radicular syndrome (LRS)

In the event of a suspected LRS, a neurological examination will be performed. This examination consists at minimum of a test of the pain distribution, the fingertips-to-floor distance when bending forward (positive at a distance of >25 cm) (Vroomen 2002), the Lasègue test (passive Straight Leg Raise [SLR]), the crossed Lasègue test or the reversed Lasègue test and a test of the muscle strength, the sensitivity and the tendon reflexes. In the event of positive findings, it must be evaluated whether the test results are in line with the area innervated by the spinal nerves. One should realise however that not all patients with radicular pain exhibit a pain pattern according to the known dermatogenic pain patterns. A possible exception is the S1 syndrome, whereby the pain usually follows the S1 dermatome (sensitivity 0.65 and specificity 0.80) (Murphy 2009). It is also known that sensitivity disorders with neuropathic pain can be very diverse; for example, hyperesthesia, hypoesthesia, hyperalgesia, hypoalgesia, allodynia, paraesthesia, dysesthesia, aftersensations, etc. (Nijs 2015).
None of the tests from the neurological examination is sufficiently sensitive and specific for determining the cause of radicular pain, such as a disc hernia (Al Nezari 2013; Scaia 2012; van der Windt 2010). The results of the physical examination should therefore always be combined with the information from the medical history. Radicular pain without motor deficit does not rule out the diagnosis, but the presence of the appropriate symptomatology does make the diagnosis more certain. In rare cases, motor deficit is also possible without pain.
Symptoms under the knee are suggestive of LRS, because the L5 syndrome (45%) and the S1 syndrome (45%) are the most common LRS syndromes.

Functional Capacity Evaluation

Test protocols known under the umbrella name Functional Capacity Evaluation (FCE) can be carried out in order to obtain an idea of a patient's ability to perform (work-related) activities (again) . FCEs are primarily used for evaluating reintegration options. The guideline for company physicians and insurance company physicians recommends FCE as a possible additional measurement instrument (Luites 2021). FCEs entail many tests, but there are also protocols that are significantly shorter and can be applied in the primary care setting with some training (Reneman 2018).
A considerable amount of attention has been paid to FCEs and its clinimetric properties in the scientific literature in recent years. Instruments such as dynamic trunk measurements, the Six Minute Walk Test, the Baltimore Therapeutic Equipment (BTE) work simulator and the performance-based tilt test appear to have a predictive value for future work-related functioning, such as faster work resumption, decreased absence after initial work resumption and improved functioning at work (De Baets 2018; Hegmann 2019).

Note B.1.3 Red flags

Reason

In recent years, there have been developments in practice and based on the literature that required a revision of the recommendations regarding red flags as described in the 2013 KNGF guideline (KNGF 2013).

Clinical question

When is it necessary to refer a patient with low back pain (back) to the general practitioner based on warning signs?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019). They are aligned to a considerable degree with the recommendations of the British National Institute for Health and Care Excellence (NICE) (De Campos 2017) and the guideline of the Belgian Health Care Knowledge Centre (KCE) (Van Wambeke 2017).

Conclusions based on the literature

Warning signs are signs or signals which are used either alone or in combination to screen patients for the possible presence of a serious, specific cause (red flag) of low back pain. The serious underlying pathology which these warning signs may indicate are conditions such as an (osteoporotic) vertebral fracture, a malignancy, an inflammation such as with axial spondylarthritis (axial SpA), intra-abdominal problems such as appendicitis and cystitis, or serious forms of canal stenosis or spondylolisthesis. Despite the importance of screening for warning signs and red flags, the diagnostic accuracy of most warning signs is limited (Cook 2018; Downie 2014; Enthoven 2016; Henschke 2009; Premkumar 2018; Tsiang 2019; Underwood 2009, 2013). Most patients (80-90%) with low back pain have at least one warning sign, while the chance that a patient with low back pain will need to be urgently referred and treated is small (Henschke 2009). Galliker analysed 22 studies (n = 41,320) where patients were referred to the emergency room (Galliker 2020), whereby 0.7 to 7.4% of the patients had a serious pathology. The chance of a false positive score of red flags is high, and the chance of an unnecessary referral is big (Grunau 2018; Henschke 2009; Premkumar 2018). There are indications that the diagnostic accuracy increases somewhat if various warning signs occur according to specific clusters, but there is little evidence of this, and the clinical relevance of warning signs remains limited (Downie 2014; Enthoven 2016; Premkumar 2018).

Conclusions based on the considerations

The guideline panel believes it is important to screen patients with low back pain for warning signs and red flags in order to decrease the chance of missing serious pathology. Patients in whom the complaints are suspected to have a specific cause – or in the event of doubt – are referred to the general practitioner.

Given that formal clinical prediction rules are lacking, the patient's individual characteristics (such as age, sex, medical history, co-morbidity, alcohol use, etc.) must always be considered when evaluating the relevance of warning signs.

If the patient has seen a physical therapist or exercise therapist without the intervention of a physician (Direct Accessibility to Physical Therapy, DAPT), then the threshold for referring the patient back to the general practitioner is lower than if the patient consults a physical therapist or exercise therapist by referral from the general practitioner or specialist. If the patient was referred by a physician, the therapist must make sure that the physician is aware of the warning signs.

Note B.2 Indications and treatment profiles

Reason

In recent years, there have been developments in practice and based on the literature that required a revision of the recommendations regarding treatment profiles as described in the 2013 KNGF guideline (KNGF 2013).

Clinical questions

1. What are the criteria for initiating physical therapy or exercise therapy in patients with low back pain?
2. How can patients with low back pain best be assigned to treatment profiles?

Method

To answer the clinical questions, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The results were analysed in a narrative manner and descriptively incorporated.
The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019).

Conclusions based on the literature

Clinical question 1: Indication for physical therapy or exercise therapy

When a patient with low back pain sees the physical therapist or exercise therapist with a need for assistance related to limitations in activities of daily living and/or social participation based on movement-related functioning, and the therapist sees no reason to refer the patient (back) to the general practitioner (see B.1.3 'Red flags'), there is an indication for physical therapy or exercise therapy (KNGF 2021; VvOCM 2019).

Clinical question 2: Assignment to treatment profiles

The guideline of the British National Institute for Health and Care Excellence (NICE) for patients with low back pain recommends considering risk stratification (e.g. using the STarT Back Screening Tool; SBST) upon initial contact with the healthcare provider and based on the risk stratification, offer simpler and less intensive support to people who are likely to recovery quickly and more complex and intensive support to people with a higher risk of persistent complaints (De Campos 2017). The guideline of the Belgian Health Care Knowledge Centre (KCE) has adopted the recommendation of the NICE and also adds a list with yellow, orange, black and blue flags to the evaluation of the risk of persistent complaints (Van Wambeke 2017). In contrast, the Danish guideline recommends, based on the consensus of the guideline panel, not routinely offering

one specific treatment to a subgroup of patients with comparable prognostic factors because the effectiveness of this is unknown (Stochkendahl 2018). The guideline for the treatment of patients with non-specific low back pain by the general practitioner is a step-by-step plan consisting of information and advice, increasing activities, exercise therapy, behavioural treatment and multidisciplinary rehabilitation (NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017).

Conclusions based on the considerations

Assignment to treatment profiles

The guideline panel believes that the risk of persistent low back pain can play an important role in the assignment to treatment profiles. The evaluation of the risk of persistent low back pain can offer important information for the timely initiation of the correct treatment strategy. The guideline panel therefore believes that patients with low back pain can best be assigned to treatment profiles based on the most important prognostic factors for persistent low back pain. The guideline panel has developed three treatment profiles based on the findings in the literature and clinical expertise about patients with low back pain. Based on the evaluation of the risk of persistent complaints, the practitioner chooses one of the three treatment profiles. The guideline panel recognises that assignment to treatment profiles, applied based on the individual evaluation by the physical therapist and exercise therapist, requires further development.

Number of treatment sessions

For patients in treatment profile 1, it is important for the focus of the treatment to be on information, advice and instructions for exercises to be performed independently. Because there is a low risk of persistent complaints in treatment profile 1, the number of treatment sessions for patients with this profile must be limited as much as possible to a maximum of three sessions. When providing information and advice, the therapist does need to take into account the diversity in the course of complaints and the patient's capacity. No treatment ranges have been formulated for patients with treatment profile 2 and 3, because the complaints can be more varied than for treatment profile 1, and the evaluation by the patient and the therapist is decisive for the ending the treatment. The guideline panel believes that for profile 2 and 3 it is important for the therapist to conduct a re-evaluation of the risk or persistent complaints if there is inadequate alleviation of the complaints and to take into account the stop criteria at all times.

Re-evaluation of the risk of persistent low back pain

If there is an inadequate alleviation of complaints in profile 1 or 2, the guideline panel recommends conducting a re-evaluation after three weeks of the risk of persistent low back pain and adjusting the treatment profile or the treatment based on the findings, or contacting the general practitioner. The re-evaluation gives the therapist a chance to assess prognostic factors that could not be properly analysed at the start of the treatment as yet (e.g. psychosocial factors). In addition, an abnormal course of low back pain can be a sign to reconsider the treatment profile and the matching treatment strategy.

If there is an inadequate alleviation of complaints in profile 2 or 3, the guideline panel recommends contacting the general practitioner after six weeks in order to jointly determine the treatment strategy going forward. In consultation with the general practitioner, it may be

decided to treat the patient for a little longer, but a specific referral can also be considered to a psychosomatic physical therapist or exercise therapist, a psychologist, company physician or medical specialist (see also A.3 'Organisation of care').
The patient, in consultation with the therapist, assesses whether there is an inadequate alleviation of complaints. Measurement instruments may be used for support. The guideline panel believes that the test results based on measurement instruments should never be leading in this.

For a patient with LRS without red flags with a complaint duration of more than six weeks and inadequate alleviation of pain and/or loss of function, the physical therapist or exercise therapist will refer the patient (back) to the general practitioner. The general practitioner will discuss with the patient whether the conservative treatment will be continued or whether referral to a neurologist is desired for assessment of the 'surgical treatment' indication (Schaafstra 2015).

Note B.2.1 Classification systems

Reason

Recent scientific literature describes various instruments that can be used to determine the best treatment for a patient, also called 'classification systems'. A systematic review identified 28 of these: 16 diagnostic, 7 prognostic and 5 treatment-based classification systems (Fairbank 2011). Such systems could serve as a foundation for the assignment of patients into treatment profiles. Within the module of this guideline, only classification systems that help guide the treatment of patients with low back pain were searched for, with no single symptomology being excluded. Four treatment-based classification systems were found for the treatment of the patient group on which this guideline focuses, whose effectiveness was actually examined. Upon closer examination of the Mechanical Diagnosis and Therapy classification system according to McKenzie, it became clear that not all patients with low back pain can be classified with it, and the method also does not provide a systematic analysis of recovery-impeding psychosocial factors. This classification system was hence omitted.
The other classification systems were:

1. the Treatment-based Classification System by Delitto (TCS);
2. the Classification Based Cognitive Functional Therapy by O'Sullivan (CB-CFT); and
3. the Subgroup for Targeted Treatment (STarT) Back Screening Tool (SBST).

To determine the classification system with which patients with low back pain could best be assigned to treatment profiles in the daily practice of the physical therapist and exercise therapist, the following clinical questions were formulated:

Clinical question

Are the following classification systems and the associated targeted treatments recommended for assigning patients to treatment profiles in the practices of physical therapists and exercise therapists?

- the Treatment-based Classification System according to Delitto (TCS)
- the Classification Based Cognitive Functional Therapy according to O'Sullivan (CB-CFT)
- treatment based on the STarT Back Screening Tool (SBST)

Method

To determine the effect of the treatment of patients who were assigned according to one of the selected profiles, a systematic review was conducted and considerations were identified with the help of the GRADE Evidence-to-Decision Framework (Alonso-Coello 2016a, Alonso-Coello 2016b).

Conclusions based on the literature

For treatment according to Delitto's classification, very small (not clinically relevant) effects were found on the crucial outcome measures, with a very low evidentiary value.

For treatment according to O'Sullivan's classification, clinically relevant effects were found on some crucial outcome measures, with a very low evidentiary value.
For treatment according to the STarT Back Screening Tool (SBST), small (not clinically relevant) effects were found on the crucial outcome measures, with a moderate evidentiary value.

Conclusions based on the considerations

Based on the above, the guideline panel does not yet recommend assigning patients to treatment profiles based on the TCS or the CB-CFT, given the lack of scientific substantiation of the classification systems, uncertainties about the psychometric properties of the systems and limitations in their implementability.
The guideline panel believes that use of the SBST may be of value for practicing physical therapists or exercise therapists because the tool is easy to use and clearly gives direction and structure to therapy, thereby helping facilitate clinical decision-making. However, the effects of the treatment of patients who are classified with this instrument based on quality of life, pain and physical functioning with this tool are small. Moreover, the cost-effectiveness of treatment according to the SBST in the Dutch setting is as yet unknown. The guideline panel therefore believes that it is not desirable to base the risk of persistent complaints exclusively on the SBST, given the limited scientific substantiation and because important prognostic factors (e.g. work-related factors) can be missed. A conditional recommendation for the SBST is hence justified.

Note B.3 Measurement instruments

Reason

In recent years, there have been developments in practice and based on the literature that required a revision of the recommendations regarding measurement instruments as described in the 2013 KNGF guideline (KNGF 2013).

Clinical question

Which measurement instruments best analyse the ICF domains and goals?

Method

This question was answered in consultation with the guideline panel by describing the recommended and optional measurement instruments that can be used during the diagnostic process. The Clinimetric Framework for Evidence-based Products was used for this (KNGF 2016).
The recommended measurement instruments are listed in the Practice Guideline and the optional measurement instruments in the Explanation.

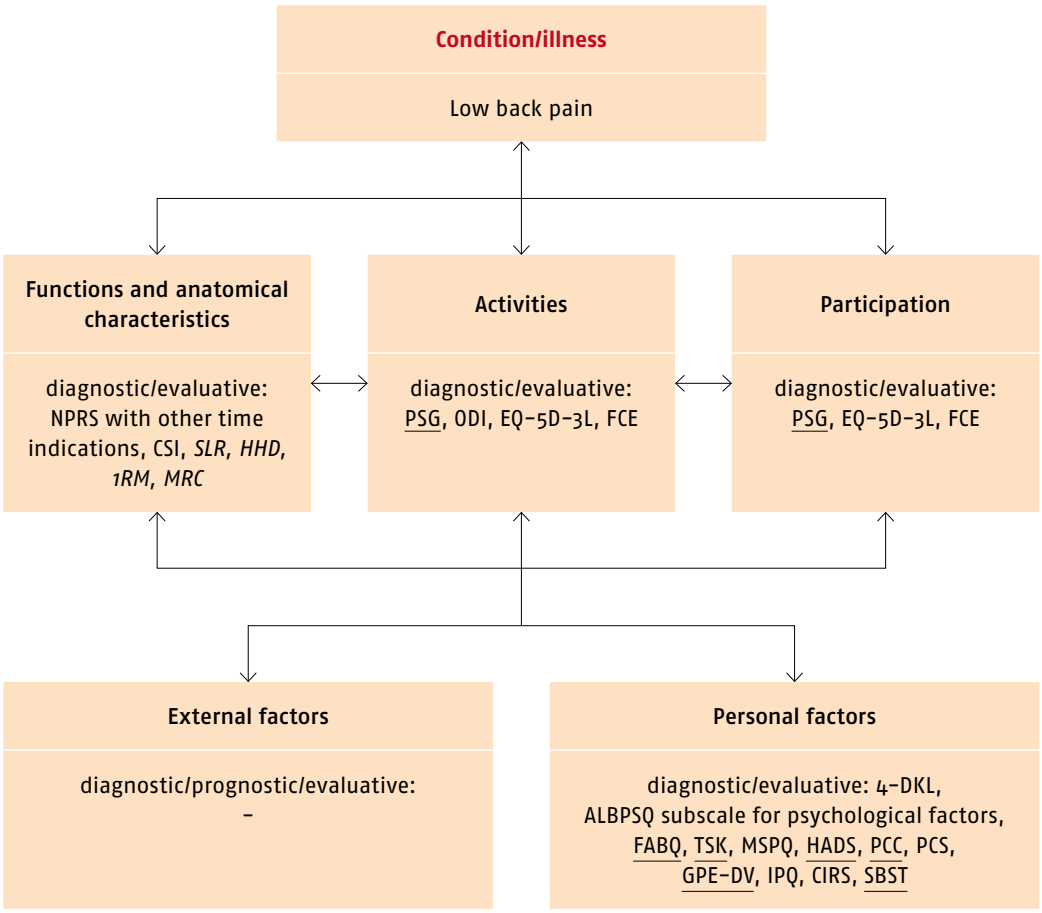
Conclusions based on the literature

When answering the clinical question, scientific literature was consulted regarding the development of a set of core measurement instruments for patients with low back pain based on three initiatives (Chiarotto 2018; ICHOM Working Group Members for Low Back Pain 2017; Verburg 2019). The guideline panel decided to prioritise the domains 'pain', 'physical functioning' and 'activities and participation in ADL' when choosing the recommended measurement instruments. There was consensus in the literature about the use of the Numeric Pain Rating Scale (NPRS) for analysing the pain intensity.

For measuring physical activity, the following questionnaires were assessed for practicability and clinimetric quality: the Oswestry Disability Index (ODI), the Roland Morris Disability Questionnaire (RMDQ) and the Quebec Back Pain Disability Scale (QBPDS). The ODI, RMDQ and QBPDS are very usable for both the therapist and the patient, and based on validity, reproducibility and responsiveness, no clear preference for one of the three can be expressed.
For measuring activities and participation in ADL, the Patient-Specific Complaints (PSC) and the Patient-Specific Goal-setting method (PSG) were assessed for practicability and clinimetric quality. The PSC is easy in its use: assessment does not take a lot of time, it barely necessitates any additional expertise or experience on the part of the therapist and moreover, requires minimal effort by the patient. The PSG is the updated version of the PSC. The PSG is also suitable for setting goals together with the patient. Training is required for correct application of the instrument in practice. The PSC was found to be sufficiently responsive in patients with low back pain. No research was done on the validity and reproducibility of the Dutch version of the PSC in this patient group. The English version was found to be valid, reliable and responsive for patients with osteoarthritis of the hip or knee. No research on the clinimetric quality of the PSG was found.

Conclusions based on the considerations

The recommended measurement instruments that the guideline panel selects are the NPRS for the average pain in the past 24 hours, the QBPDS for physical functioning and the PSC for activities and participation in ADL. The NPRS and QBPDS were selected as recommended measurement instruments because of their uniformity with the previous guideline, due to which already collected and future data remain comparable. In addition, the QBPDS is an oft-used questionnaire in daily practice in the Netherlands. This choice also facilitates the implementability of the guideline.
The guideline panel selects the PSG as an optional measurement instrument because use of the PSG requires additional training and the clinimetric quality of this instrument is not known. ODI version 2.1a and the RMDQ were also selected as optional measurement instruments.
The guideline panel believes that ideally a combination of questionnaires and performance or functional tests should be selected in order to identify the parameters. However, the guideline panel does acknowledge that there is a lack of a solid performance and functional test in order to meet this need. The guideline panel therefore advises conducting an additional (movement) analysis or functional test based on the outcomes of the questionnaires.
The guideline panel believes that the evaluative optional measurement instruments should focus as much as possible on the patient's need for assistance and that 'measuring for measuring's sake' is not desirable.
See the figure with the optional measurement instruments and the parameters of those measurement instruments. All measurement instruments mentioned in the guideline with the associated interpretation are available at www.meetinstrumentenzorg.nl.



1RM = Submaximal One-Repetition Maximum Test; 4-DCL = Four-Dimensional Complaints List; ALBPSQ = Acute Low Back Pain Screening Questionnaire; ALBPSQ – DLV = Acute Low Back Pain Screening Questionnaire – Dutch Language Version; CIRS = Cumulative Illness Rating Scale; CSI = Central Sensitization Inventory; EQ-5D-3L = Euroqol-5D-3L; FABQ = Fear-Avoidance Beliefs Questionnaire; GPE-DV = Global Perceived Effect; HADS = Hospital Anxiety and Depression Scale; HHD = Hand-held Dynamometer; IPQ = Illness Perception Questionnaire; MRC = Medical Research Council scale; MSPQ = Modified Somatic Perception Questionnaire; NPRS = Numeric Pain Rating Scale; ODI = Oswestry Disability Index version 2.1a; PCC = Pain Coping and Cognition List; PCS = Pain Catastrophizing Scale; PSG = Patient Specific Goal-setting method; SBST = StarT Back Screening Tool; SLR = Straight Leg Raise; TSK = Tampa Scale of Kinesiophobia.

Italics = a performance test or functional test, non-italics = a questionnaire or an observation list.
Note: No optional measurement instruments are described for identifying external factors.

Optional measurement instruments

Parameters with the linked optional measurement instruments

Parameter	Measurement instrument	Measurement point	Comments
sciatica in the leg	Straight Leg Raise (SLR); the Lasègue's sign or the reversed Lasègue test	intake	see B.1.2 'Physical examination'
co-morbidity	Cumulative Illness Rating Scale (CIRS)	intake	
activities and participation in ADL	Patient-Specific Goal-setting method (PSG)	intake, interim evaluation, completion	as an alternative for the PSC
participation and work	Functional Capacity Evaluation (FCE)	intake, interim evaluation, completion	see B.1.2 'Physical examination'
	Dutch version of the 'Blue flags questionnaire'	intake	
pain	NPRS with other time indications	intake, interim evaluation, completion	in addition to the NPRS average pain in the past 24 hours
	Central Sensitization Inventory (CSI)	intake, interim evaluation, completion	
	Illness Perception Questionnaire (IPQ)	intake, interim evaluation, completion	
activities	Oswestry Disability Index (ODI) version 2.1a or the Roland Morris Disability Questionnaire (RMDQ)	intake, interim evaluation, completion	as an alternative for the QBPDS
muscle strength	Hand-Held Dynamometer (HHD), knee extension	intake, interim evaluation, completion	
	Submaximal One-Repetition Maximum Test (1RM)	during treatment	
motor deficit	Medical Research Council scale (MRC)	intake	score ≤3/5 in combination with sensory disorders occurring in less than 48 hours = red flag (see B.1.3 'Red flags')
general health status or health-related quality of life	Euroqol-5D-3L (EQ-5D-3L)	intake, interim evaluation, completion	

Parameter	Measurement instrument	Measurement point	Comments
psychological and psychosocial stress	Four-Dimensional Complaint List (4-DCL)	intake, interim evaluation, completion	
	Acute Low Back Pain Screening Questionnaire (ALBPSQ) subscale for psychological factors	intake, interim evaluation, completion	
pain-related fear of movement	Fear-Avoidance Beliefs Questionnaire (FABQ)	intake, interim evaluation, completion	
	Tampa Scale of Kinesiophobia (TSK)	intake, interim evaluation, completion	
somatisation	Modified Somatic Perception Questionnaire (MSPQ)	intake, interim evaluation, completion	
anxiety and/or depression	Hospital Anxiety and Depression Scale (HADS)		
	intake, interim evaluation, completion		
coping	Pain Coping and Cognition List (PCCL)		
	intake, interim evaluation, completion		
negative expectations about recovery or catastrophisation	Pain Catastrophizing Scale (PCS)	intake, interim evaluation, completion	
experienced recovery	Global Perceived Effect (GPE-DV)	intake, interim evaluation, completion	
risk of persistent symptoms	StarT Back Screening Tool (SBST)	intake, interim evaluation	for supporting assignment to treatment profiles. See B.2 'Determining the indication and treatment profiles'
	Acute Low Back Pain Screening Questionnaire - Dutch Language Version (ALBPSQ - DLV)	intake, interim evaluation	

Note C.1 Information and advice and (pain) education

Reason

In recent years new insights have been obtained in the area of information and advice and (pain) education that required a revision of the information in the 2013 KNGF guideline (KNGF 2013).

Clinical question

Which information and advice and (pain) education is recommended for patients with low back pain?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The results were analysed in a narrative manner and descriptively incorporated.
The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019).

Conclusions based on the literature

Information and advice

The goal of information and advice is to influence the knowledge, attitude and behaviour of a person who is advised as well as to give patients and their loved ones insight into the condition or illness and its treatment (Perez 2017). Thanks to this information and advice, the patient is able to make better assessments and decisions with respect to his/her complaints (Perez 2017). Information and advice is recommended for all patients with low back pain (Almeida 2018; Lin 2019; Oliveira 2018). The information and advice takes place during the preliminary stage, during the treatment and during follow-up care (Netherlands Society for Neurology 2020). Recurring topics in recent literature regarding the contents of the information and advice for low back pain are:

- The importance of providing information and offering reassurance about the nature and the diagnosis of low back pain (Almeida 2018; Lim 2019; NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017).
- The importance of providing information about the treatment options (Lim 2019; NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017).
- The importance of offering certainty about the prognosis of low back pain (Almeida 2018; Lim 2019; Lin 2019; Oliveira 2018; Stochkendahl 2018; Van Wambeke 2019).
- The importance of avoiding language that encourages fear of pain and catastrophic thinking, terms like: injury, degeneration or wear and tear (Almeida 2018).
- The importance of encouragement to stay active and limit bed rest (Almeida 2018; Lin 2019; NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017; Oliveira 2018; Stochkendahl 2018; Van Wambeke 2017).
- Encouraging self-management for recovery, the importance of active coping strategies, positive emotions and a healthy lifestyle (Almeida 2018; Perez 2017; Van Wambeke 2017).
- The importance of clear, consistent and personalised information (Lim 2019).
- The importance of supporting the information and advice with models, videos, folders and/or a decision-making aid (Netherlands Society for Neurology 2020).

(Pain) education

For some patients information and advice alone are not sufficient. (Pain) education goes beyond information and advice. The Chronic Pain Healthcare Standard, which focuses on general chronic pain, states the following about (pain) education: '*(Pain) education effectively creates conditions and enables organisation of activities and learning processes aimed at increasing knowledge and insight, as well as improving opinion building, bringing about behavioural changes and learning skills*' (Perez 2017). According to this healthcare standard, a one-sided biomedical approach to pain complaints by a healthcare professional can help maintain the pain. In the long or short term, a one-sided approach can result in limitations in daily life and in an adverse experiencing of the pain (e.g. overestimating the severity and influence of pain, i.e. catastrophisation) (Perez 2017). In recent years a shift has taken place towards biopsychosocial education, which focuses on the function of the spine, information about remaining active and information about coping with pain. Such biopsychosocial (pain) education may be effective in the treatment of low back pain (Hurley 2016).
The explanation can vary from general information and advice to intensive (pain) education and is aligned with the knowledge level and problems of the patient and his/her environment (Perez 2017).

Chronic Pain Healthcare Standard

The Chronic Pain Healthcare Standard describes the following points of attention with respect to (pain) education:

- Use laymen's terms.
- Acknowledge the pain. Do not label the pain as 'psychological' or 'imaginary'.
- Include the patient's 'personal' explanations in the (pain) education.
- Explain the functioning of the nervous system and the pain system.
- Mention the meaning of pain; pain isn't (only) a sign of damage.
- Mention the consequences of long-term pain on physical, psychological and social aspects.
- Explain the biopsychosocial model of pain.
- Discuss the patient's own role and capabilities.
- Mention the roles, tasks and capabilities of various healthcare professionals.
- Discuss the methodology and basic principles of the treatment (Perez 2017).

Conclusions based on the considerations

During the barrier analysis in the focus group, the physical therapists and exercise therapists present indicated that the term 'non-specific' does not do justice to the patient's complaints and may evoke a negative association. It was therefore decided to include a recommendation in the guideline about avoiding the term 'non-specific'.
'Reassure the patient' is common advice to healthcare providers who see patients with low back pain. However, there are indications in the literature that a reassuring message aimed at offering information about a good prognosis of low back pain is mainly adequate for patients who exhibit little stress and have an adaptive pain response pattern. For other patient groups, this message may be insufficient or even counter-productive (Hasenbring 2015). Patients with low back pain need clear, consistent and personalised information about the prognosis, treatment options and self-management strategies (Lim 2019; Traeger 2017).

The guideline panel is of the opinion therefore that it is important to honestly discuss the following topics.

- The nature of low back pain: In most cases, low back pain is innocent in nature.
- The diagnosis: There is often no clear, demonstrable cause of back pain (see A.2.1 'Epidemiology, pathophysiology and co-morbidity').
- The course of the low back pain: After one month approximately a quarter and after three months approximately half of patients are recovered with regard to pain and physical activity. After this the recovery is slower and some patients will still have pain and functional problems.
- The prognosis: One to two in three people have a chance of relapsing within one year of recovery from a previous episode. For many people, low back pain is a dynamic condition whereby episodes of little to no back pain alternate with episodes of moderate to severe back pain. The assumption is that a number of factors contribute to the occurrence of low back pain or the occurrence of a new episode of low back pain and that a number of factors influence the prognosis (see A.2.4 'Etiological and prognostic factors').

Although much systematic review was carried out on information and advice and (pain) education of low back pain, there is still uncertainty about when information and advice are no longer sufficient and the practitioner must switch to (pain) education. The guideline panel believes that pain education is the best choice for patients with treatment profile 3, e.g. if there is unrealistic pain-related fear of movement and/or catastrophisation.

Note C.2.1 Exercise therapy

Reason

Exercise therapy can consist of various forms of physical activity, with the common goal of improving a person's functioning. The intervention exercise therapy covers a wide range of exercises that are based on various theoretic models. Exercise therapy can take place under the supervision of a therapist at the practice or can be performed independently at home or outdoors and can be done individually or in a group.
The barrier analysis showed that there is a need for a pronouncement about the benefit of various types of exercise therapy. Ultimately, the exercise therapy guideline panel prioritised Motor Control Exercises (MCE) and Mechanical Diagnosis and Therapy (MDT) according to McKenzie. The barrier analysis also showed that there is a need for a pronouncement about which type of exercise therapy is indicated for which patient and what the exercise therapy must satisfy.

Clinical questions

1. Are exercise therapy in general, motor control exercises and Mechanical Diagnosis and Therapy (MDT) according to McKenzie recommended for patients with low back pain?
2. Which type of exercise therapy is recommended for which patient?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain.

The results were analysed in a narrative manner and descriptively incorporated.
The recommendations were formulated based on the GRADE Evidence-to-Decision Framework (Alonso-Coello 2016ab).

Conclusions based on the literature

Exercise therapy in general

Based on a search, 15 systematic reviews were identified that describe the effectiveness of exercise therapy. For patients with acute and subacute low back pain, no clinically relevant effects of exercise therapy on pain and physical functioning were found compared to no exercise therapy, with low evidentiary value. Even when exercise therapy is compared to other conservative treatment in patients with acute and subacute low back pain, no clinically relevant differences were found. This applies to both the short term and the long term. For patients with chronic low back pain, the most recent systematic review of high methodological quality found a clinically relevant effect of exercise therapy compared to no exercise therapy on pain (MD −10.7 on a scale of 0 to 100; 95% CI −14.1 to −7.4; 2,466 participants) and physical functioning (MD −10.2 on a scale of 0 to 100; 95% CI −13.1 to −7.3; 2,366 participants) in the short term, with moderate evidentiary value (Hayden 2019). For exercise therapy compared to other conservative treatment, conflicting results were found for pain and physical functioning in the short term; the small (not clinically relevant) effects were sometimes in favour of exercise therapy and sometimes in favour of other conservative treatment. In the long term, no clinically relevant effects of exercise therapy were found for these outcome measures compared to no exercise therapy or another form of exercise therapy.

Motor Control Exercises (MCE)

The effectiveness of motor control exercise (MCE) compared to no treatment in patients with acute low back pain is unknown. Given the predominantly low evidentiary value, there is much uncertainty about the effects of MCE for acute low back pain compared to another form of exercise therapy or manual therapy. The available scientific proof does not show any clinically relevant differences between MCE and another form of exercise therapy or manual therapy on pain or physical functioning in the short and long term.
For patients with chronic low back pain, evidence was found of a clinically relevant effect on pain when MCE was compared to minimal intervention (placebo physical therapy, education or advice and no treatment) in the short and long term, but no clinically relevant effect was found on physical functioning (evidentiary value low to moderate). However, no clinically relevant difference was found between MCE and another form of exercise therapy on pain and physical functioning in the short and long term (low to high evidentiary value).

Mechanical Diagnosis and Therapy (MDT) according to McKenzie

There are lots of uncertainties about the effects of MDT as a result of (very) low evidentiary value of the research on this. The effectiveness of MDT compared to doing nothing/waiting/placebo/sham (passive therapy) in patients with acute, subacute or chronic low back pain is unknown.
There is conflicting evidence of a short-term effect of MDT on pain in patients with acute low back pain. In systematic reviews, clinically relevant differences were found when compared to another intervention but not when compared with passive therapy. Absolutely no clinically relevant short-term effect of the MDT was found on physical functioning in this patient group.

In patients with chronic low back pain, MDT does not lead to clinically relevant effects on pain and physical functioning in the short term compared to another intervention, and the long-term effect of the method is not known in this patient group. Treatment using this method may be more effective if more attention is paid to the classification of patients and specific training of the therapists.

Conclusions based on the considerations

Exercise therapy in general

In patients with chronic low back pain, exercise therapy produces a clinically relevant alleviation of pain and improvement of physical functioning in the short term when exercise therapy is compared to no exercise therapy, with moderate evidentiary value. There is still a lot of uncertainty about the effectiveness of exercise therapy compared to no exercise therapy in the long term. It is also still uncertain whether exercise therapy in patients with acute low back pain is effective. Nevertheless, the guideline panel believes that exercise therapy can be recommended for patients with low back pain.
The guideline panel arrived at this decision based on the following considerations:

- Exercise therapy, if done correctly, is assessed as safe.
- There are indications in recent scientific literature that exercise therapy for patients with subacute and chronic low back pain is cost-effective when compared to usual care and is associated with healthcare cost savings.
- The recommendation concerns patients for whom an indication for physical therapy or exercise therapy has been determined. Within this group of patients, exercise therapy in combination with information and advice and (pain) education is the principal intervention based on which a physiological effect can be expected.
- Exercise therapy in patients with low back pain is considered an important intervention within healthcare and is recommended in (inter)national guidelines (including the NHG Standard on Non-specific Low Back Pain, the NHG Standard on Lumbosacral Radicular Syndrome, the Guideline on Lumbosacral Radicular Syndrome (LRS) of the Netherlands Society for Neurology, the guideline of the National Institute for Health and Care Excellence (NICE), the guideline of the Belgian Health Care Knowledge Centre (KCE), the guideline of the Danish Health Authority and the guideline of the American College of Physicians).
- Exercise therapy encourages an active lifestyle and the patient's self-reliance; this matches the emphasis placed by the guideline on an active approach.

The guideline panel believes therefore that exercise therapy is strongly recommended for patients with an indication for physical therapy within profile 2 and 3. For patients with low back pain who are assigned to profile 1, a conditional recommendation has been formulated. Instructions for exercises to be independently performed can be considered if these are aligned with the patient's need for assistance and need for care.
The current literature does not provide a definitive answer as to which form of exercise therapy is indicated for which patient (see also B.2.1 'Classification systems'). In general, it does not appear from the literature review that one form of exercise therapy is more effective than another. The guideline panel believes that the choice is made based on the patient's needs, preferences and capabilities and the therapist's knowledge and skills.

Based on the profile classification, more intensive therapy is recommended for patients with a higher risk for persistent low back pain and less intensive therapy for patients with a lower risk for this (see B.2 'Indications and treatment profiles'). Keeping costs manageable plays an important role in this recommendation.
Although there are still uncertainties about the cost-effectiveness of exercise therapy in the group setting compared to individual therapy, the guideline panel considers it likely that exercise therapy in a group can result in cost savings. Group exercise therapy is particularly useful for the longer treatment courses, whereby repeated incentives (physiological as well as information and advice and education and contact with fellow patients) can contribute to recovery. To be able to start group treatments, a treatment course with one or more individual sessions is almost always conditional. An additional advantage of group therapy is the longer duration per treatment session and the associated opportunities to give adequate training incentives. The guideline panel also believes that group exercise therapy can be considered for patients in profile 2 and 3 as a follow-up to one or more individual sessions, if the therapist estimates that this approach will lead to faster recovery.

Motor Control Exercises (MCE) and MDT

The results of the literature review show that MCE results in a clinically relevant effect on pain compared to no exercise therapy in patients with chronic low back pain in the short and long term, but no clinically relevant effect on physical functioning (evidentiary value low to moderate). There are many uncertainties about the effectiveness of MDT in patients with low back pain. This is primarily because the effectiveness of MDT has not been sufficiently compared with the effectiveness of no exercise therapy. No clinically relevant differences were found between the effectiveness of MDT and another intervention or another form of exercise therapy. Furthermore, the encountered proof is largely of low quality. The guideline panel believes that there are no objections to considering MCE or MDT if the therapist has the expertise to apply these methods.

Note C.2.2 Type and dosage of the exercise therapy

Reason

Exercise therapy is recommended for patients with low back pain. The dosage, in combination with the duration of the complete intervention and therapy compliance, can contribute to the actual effectiveness of the exercise therapy (Geneen 2017). Here it is important to trigger the desired physiological response based on the right training incentive (dose response). The dosage of an intervention is understood to mean the quantity of physical activity that is provided for a specific task. Dosage is reported in terms of frequency, duration (of an individual session) and intensity (spent time and/or resistance or exertion during a specific period) (Gallois 2017). In daily practice, the dosage of the exercise therapy is aligned with the treatment goals and depends on the treatable traits for therapy that have been determined during the diagnostic process. The American College of Sports Medicine differentiates between exercise therapy for improving muscle strength, aerobic endurance, flexibility and neuromotor control (Garber 2011). Neuromotor exercise therapy includes balance, co-ordination and proprioception training (Garber 2011). In order to optimise the effectiveness of exercise therapy in daily practice, this module discusses the dosage needed in order to produce the desired physiological training incentive.

Clinical question

Which frequency, intensity, type and time span of exercise therapy is recommended for patients with low back pain?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The results were analysed in a narrative manner and descriptively incorporated. The information has been supplemented by the recommendations for measuring and prescribing exercise therapy of the American College of Sports Medicine (ACSM) (American College of Sports Medicine 2017; Garber 2011). The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019).

Conclusions based on the literature

Exercise therapy is recommended in most (inter)national guidelines of high methodological quality. However, there are no recommendations in any guideline about the frequency, intensity and type of exercise therapy or the time span of the exercise therapy. Based on consensus in the guideline panels, it is described that the set-up of the exercise therapy is important for fostering therapy compliance and encouraging self-management. For example, by aligning the exercise therapy with the patient's needs, capabilities and preferences and by taking into account a dosage with which the patient can sustain the exercise therapy.
The ACSM guidelines describe four components that are important for prescribing exercise therapy: Frequency, Intensity, Time and Type (FITT). The ACSM has incorporated the first three components into its recommendations for exercise therapy for patients with low back pain to improve muscle strength, aerobic endurance and flexibility. In addition, the ACSM has formulated a number of additional recommendations for exercise therapy in this patient group. The ACSM has not included any recommendations aimed at neuromotor exercise therapy for low back pain. Their recommendations about this form of neuromotor exercise therapy concerns healthy participants.

Conclusions based on the considerations

The scientific literature does not provide a definitive answer about which type of exercise therapy is recommended for which patient. Based on the other considerations, the guideline panel believes it is important – on behalf of the feasibility and in order to encourage therapy compliance – to focus the exercise therapy on the patient's needs, preferences and capabilities as determined during the medical history taking and the physical examination. The guideline panel follows the type classification of the ACSM guidelines for exercise therapy for improving muscle strength, aerobic endurance, flexibility and neuromotor control. This also applies to the execution, meaning the frequency, intensity and time span of the exercise therapy. The guideline panel also believes it is important to keep in mind the feasibility for the patient when selecting the dosage of the exercise therapy. The exercise therapy is therefore devised taking into account co-morbidity that impedes physical functioning. The need for assistance and treatment goals are guiding when determining the time span of the exercise therapy. The guideline panel does, however, deem it important to determine the time span of the exercise therapy prior to the start of treatment and scale back the supervision as quickly as possible, with the patient's self-reliance being encouraged as much as possible.

Note C.3 Behaviour-oriented treatment

Reason

The barrier analysis showed that there is a need for pronouncements about the benefit of various forms of behaviour-oriented treatment in patients with low back pain. This note contains an overview of the effectiveness of behaviour-oriented treatment forms and also analyses the other considerations. The definitive recommendations were formulated based on the data about the effectiveness of the various treatment forms in combination with other considerations.

Clinical questions

- Are behaviour-oriented treatments administered by an exercise therapist or physical therapist recommended?
- Which form of behaviour-oriented treatment is recommended for which patient?

Research has shown that factors such as psychological distress, pain-related fear of movement, feelings of depression, passive coping and negative expectations about recovery and catastrophisation influence the pain perception and pain sensation, decreased physical functioning and quality of life (Lee 2015; Linton 2000; Wertli 2014). Over the years the traditional biomedical paradigm has been replaced by the biopsychosocial paradigm in which more focus is placed on the role of the psychological and social factors in the occurrence and persistence of low back pain. This paradigm shift in the approach to patients with pain ensured that programmes for patients with chronic pain are increasingly aimed at changing the patient's thoughts and behaviour regarding the pain, with the goal of optimising physical activity and participation instead of alleviating the pain. Forms of treatment aimed at a different manner of dealing with pain are designated as behaviour-oriented interventions. These treatment forms use operant (e.g. graded activity), cognitive (exposure in vivo) and respondent learning processes (e.g. relaxation exercises, mindfulness and electromyography biofeedback training [EMG biofeedback]) (KNGF 2013). Behaviour-oriented treatment interventions also include interventions such as Acceptance and Commitment Therapy (ACT) and interview techniques (e.g. motivational interviewing) (McCracken 2014). Pain education, including learning to deal with pain and anxiety differently, are basic components of graded activity and exposure in vivo and is described in 'C.1 Information and advice and (pain) education'.

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The results were analysed in a narrative manner and descriptively incorporated. The recommendations were formulated based on the GRADE Evidence-to-Decision Framework (Alonso-Coello 2016ab).

Conclusions based on the literature

Conclusions based on evidence-based guidelines of high methodological quality

The multidisciplinary guidelines of the National Institute for Health and Care Excellence (NICE) and the Belgian Health Care Knowledge Centre conclude that behaviour-oriented treatment has added value as a supplement to physical therapy or exercise therapy treatment for patients with low

back pain (De Campos 2017; Van Wambeke 2019). There is no proof of the effectiveness of isolated forms of behaviour-oriented treatment. Behaviour-oriented treatment in combination with exercise therapy may be cost-effective compared to interventions that do not take into account psychosocial factors. Cognitive behavioural therapy should be considered for people with low back pain, with or without radicular pain, but only as part of a multimodal treatment with a supervised exercise programme.
The guideline of the American College of Physicians (ACP) recommends the following for people with chronic low back pain (complaint duration > 12 weeks) (Qaseem 2017a): mindfulness aimed at stress reduction (moderate evidentiary value), progressive relaxation therapy, EMG feedback, operant therapy and cognitive behavioural therapy (low evidentiary value).

Conclusions based on recent systematic reviews

A search strategy (period 2015-2020) for systematic reviews investigating the effectiveness of behaviour-oriented treatments in patients with low back pain and whereby treatments were administered either entirely or to a significant extent by physical therapists or other paramedical professionals yielded eight literature reviews (Baez 2018; Barbari 2019; Bostick 2017; Hajihasani 2019; Hall 2018; Mariano 2018; Van Erp 2019; Zhang 2019). In three systematic reviews (Hall 2018; Van Erp 2019; Zhang 2019), all behaviour-oriented treatments were administered by physical therapists, and in the other five literature reviews, these were administered either entirely or to a significant extent by paramedical professionals. Two systematic reviews pooled the results (Hall 2018; Zhang 2019) and the other six presented a narrative synthesis of the included studies.
The systematic reviews generally found positive effects of behaviour-oriented treatment (either as a supplement to physical therapy or on its own) compared to various types of control treatments on pain and/or physical functioning in the short term and/or long term. The effects varied from small and not clinically relevant to moderate and clinically relevant. The positive effects on pain and physical functioning were less clear or inconsistent when the behaviour-oriented treatment was compared to a physically active treatment. The effectiveness of behaviour-oriented treatment was more favourable if it was aligned with the patient. Multiple researchers indicated that it is important for physical therapists to be trained in administering behaviour-oriented treatments.
Three systematic reviews (Barbari 2019; Van Erp 2019; Zhang 2019) evaluated the adverse effects of behaviour-oriented treatment. They concluded that these treatments were not studied frequently, but that the chance of adverse effects is likely not big and that these are rare or never serious.
In two systematic reviews (Hall 2018; Van Erp 2019) in which the evidentiary value was evaluated according to the GRADE method, the researchers concluded that the evidentiary value for the effectiveness of behaviour-oriented treatments is moderate to high. However, the guideline panel finds that there are still many uncertainties. For example, there are few (large) studies available, and there is uncertainty as to the extent to which results of studies can be compared to each other. For example, RCTs contain a large variety of practitioners, treatment methods and treatment hours, and it is often impossible to conduct a valid meta-analysis. The results of the eight systematic reviews should also be viewed with some reticence, because they all score 'critically low' in quality according to the AMSTAR 2 method (Shea 2017).

Conclusions based on the considerations

It is possible for there to be a positive effect of behaviour-oriented treatment on pain and physical functioning as a supplement to exercise therapy for patients with low back pain with or without sciatica in the presence of dominant psychological recovery-impeding factors. Because

the evidentiary value is predominantly low and the effects vary, the guideline panel deems a conditional recommendation ('consider') for the administration of behaviour-oriented treatment to be in order.

The practice

Physical therapists and exercise therapists influence the thoughts and behaviour of their patients on a daily basis. Techniques and methods such as education, motivational interviewing, the pain-consequences model (Van Erp 2018), behavioural lenses (Elbers 2018), as well as empathetic listening, assessing the need for assistance, reassurance and responding to someone's needs, or showing the patient and having them experience what is possible, are used. The degree of complexity determines which kind of behaviour-oriented techniques or interventions are indicated. For profiles 1 and 2, a thorough explanation and focus on the biopsychosocial model are sufficient. For profile 3, more is expected from the therapist in this regard. Good communication skills are crucial when applying behaviour-oriented interventions (Stewart 2018). Based on mutual trust, the patient can be motivated to move and be therapy compliant, and progress can be made in coping with the low back pain and its consequences (self-management), and in acquiring the capability of living one's life as one wants in the physical, social and psychological sense (empowerment) (Du 2017; Oliveira 2012).
The guideline panel stresses the importance of using questionnaires for analysing psychosocial factors (see B.3 'Measurement instruments') in order to prevent important recovery-impeding or recovery-facilitating factors from remaining underexposed, with negative consequences for the clinical reasoning process and the treatment results. What's more, the questionnaires can be used as support when entering into the dialogue process with the patient and facilitating the awareness process.

Time-contingent exercise programme

When resuming or expanding activities, the recommendation is to gradually improve physical functioning and participation with a time-contingent programme. By offering a structured programme containing agreements about what (which activity), how (in which way exactly), when (on which days and at what times) and where (at which location) things will be done, the manner and speed of the build-up will not be dictated (any more) by the degree of pain someone is experiencing. By detaching activities from pain, the patient will learn that moving is possible and can have positive effects. This can result in patients building confidence in their own abilities and (re)gaining pleasure in exercise. More knowledge, more skills and a greater amount of self-confidence with regard to handling back pain shall motivate patients to deal with their complaints differently (self-management) and take responsibility for improving the functioning in the various domains of experienced health (Huber 2016) and quality of life (empowerment) (Köke 2014). In order to create a successful, gradual, time-contingent programme, it's important for the patient to actively participate and formulate meaningful goals and for the therapist to be well aware of the patient's motives when starting treatment (Veenhof 2006).
The diagnostic and treatment process wherein change of the exercise behaviour is the focus with a biopsychosocial approach is described in the Exercise Therapy Diagnostics and Intervention Model (ODIM) (VvOCM 2015). There has been little research conducted on the effectiveness of structured, gradual, time-contingent exercise programmes in the primary care setting where treatment goals were formulated by the patient (Gardner 2019).

Which form of treatment for which patient?

Behaviour-oriented treatments within the domain of the physical therapist and exercise therapist consist of a wide range of treatment options and theoretical concepts. The discussed three guidelines and eight systematic reviews do not provide a definitive answer about which form of treatment is indicated for which patient or about the desired treatment intensity. The impression that various types of behaviour-oriented treatments do not differ or only differ slightly in effectiveness in patients with low back pain is confirmed in various other systematic reviews (Bunzli 2011; Chou 2017; Henschke 2010; Holden 2014; Lopez-de-Uralde-Villanueva 2016; Macedo 2008, Pardos-Gascón 2021; Richards 2013; Toomey 2016; Van der Giessen 2012).
In order to assess the psychological recovery-impeding factors, the therapist, together with the patient, explores the correlation between complaints, cognitions, emotions and behaviour and social aspects. The findings of the medical history taking and physical examination, the patient's needs, preferences and capabilities in combination with the therapist's knowledge and skills are decisive for the definitive choice. Here one must realise that low back pain is a multifactoral biopsychosocial pain syndrome, and various processes can lead to an alleviation of complaints, behavioural change and increased internal self-regulation. The higher the level of complexity, the more necessary the referral to and collaboration with other professional caregivers such as the general practitioner, psychosomatic physical therapist and exercise therapist and psychologist.

Note C.4.1 Mobilisations and manipulations

> This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

Reason

The 2013 KNGF Guideline on Low Back Pain advises considering passive arthrogenic mobilisation or manipulation if the patient has an abnormal course of low back pain and there is a lack of dominant, psychosocial, recovery-impeding factors. Mobilisations or manipulations are not advised in the event of acute complaints or in the presence of dominant, psychosocial, recovery-impeding factors. The recommendations were based on two systematic reviews (Dagenais 2010; Rubinstein 2011). Since the publication of the previous guideline, various new RCTs and systematic reviews have appeared, necessitating an update of the literature review. An in-depth analysis was also needed because the inclusion criteria of the two mentioned systematic reviews do not entirely coincide with the criteria of the current guideline. Dagenais and Rubinstein included other RCTs, among other things, whereby the effectiveness of mobilisations and manipulations was compared to that of medication, injections or alternative treatment methods. The current guideline compares the effectiveness of mobilisations and/or manipulations only with the interventions that are within the scope of the guideline.

Clinical question

Are passive arthrogenic mobilisations and/or manipulations (high-velocity-thrust techniques) – either as a supplement to exercise therapy or on their own – recommended for patients with low back pain?

Method

In order to answer this clinical question, systematic review was conducted and considerations were analysed according to the GRADE Evidence-to-Decision framework (Alonso-Coello 2016ab).

Conclusions based on the literature

A total of 57 RCTs met the inclusion criteria of the current guideline. The effectiveness of mobilisations and/or manipulations was compared in various studies. These studies compared mobilisations and/or manipulations – either as a supplement to exercise therapy or on their own – with interventions that are within the scope of the guideline, sham manipulation, placebo or no treatment. The effects of mobilisations and/or manipulations were somewhat greater on physical functioning than on pain but were small for both outcome measures in general, both in the short term and the long term. Compared to mobilisation, the effect of manipulation on pain in the short and long term was also small; the difference in effect regarding functionality was clinically relevant. The evidentiary value according to the GRADE method varies for all comparisons between very low (9x), low (10x) and moderate (1x). There was no clear difference in evidentiary value in the short or long term with regard to pain or physical functioning.
From this one can conclude that there is limited evidence for small (not clinically relevant) positive effects of mobilisation/manipulation, either as a supplement to exercise therapy or on its own, on pain and physical functioning compared to other interventions that are within the scope of the guideline. The table below summarises the effectiveness of mobilisations and/or manipulations and the evidentiary value of six different comparisons. All effects are for the benefit of the intervention.

Overview of the effectiveness and evidentiary value of mobilisations and/or manipulations

Intervention	Control	Pain		Physical functioning	
		Complaints <4 months	Complaints ≥4 months	Complaints <4 months	Complaints ≥4 months
		Effects/evidentiary value			
mobilisation/ manipulation + exercise therapy	exercise therapy (+ another intervention according to the guideline, if needed)	slight/low	slight/ moderate	slight/very low	slight/very low
mobilisation/ manipulation	intervention(s) according to the guideline	slight/low	slight/low	slight/low	slight/low
mobilisation/ manipulation	sham mobilisation/ manipulation	clinically relevant/ very low	slight/very low	clinically relevant/ very low	slight/low
mobilisation/ manipulation	placebo treatment	slight/very low	-	clinically relevant/ low	-
mobilisation/ manipulation	no treatment	slight/very low	-	clinically relevant/ low	-
manipulation	mobilisation	slight/very low	slight/low	clinically relevant/ very low	clinically relevant/ very low

Conclusions based on the considerations

Despite the limited evidence and the small effects of mobilisation/manipulation, the guideline panel has formulated a recommendation for considering this type of intervention for patients with low back pain if the problem is mechanical in nature due to conditions within the neuromusculoskeletal system. Conditions can consist of decreased (segmental or regional) mobility, a stiff/rigid end-feel or increased muscle tension (Pool 2014). The guideline panel offered the following argumentation for this:

- the adverse effects are rarely or never serious, although extensive information about this is limited;
- the results of mobilisation/manipulation may not have been studied suboptimally because almost all included studies selected patients based on the presence of low back pain without evaluating whether there were also problems with the neuromusculoskeletal system;
- in clinical practice, experiences with mobilisations and manipulations in patients with a movement disorder within the neuromusculoskeletal domain are positive (Pool 2014);
- the results from the literature review are generally small, but all comparisons are in favour of mobilisation/manipulation;
- recent systematic reviews conclude that mobilisation/manipulation may be cost-effective for patients with low back pain.

The guideline panel advises to only consider mobilisation/manipulation as a supplement to exercise therapy because:

- the focus within the guideline is on an active approach;
- there is uncertainty about the specific effects of mobilisation/manipulation; for instance, the evidence that the effects of singular mobilisation/manipulation are clinically relevant compared to sham, placebo or no treatment is low to very low;
- mobilisation/manipulation as a supplement to exercise therapy is aligned to an important degree with clinical practice, wherein mobilisations or manipulations are rarely applied as unimodal intervention, but rather usually in combination with exercises and advice;
- there is some evidence that patients are more satisfied with the treatment if mobilisation/manipulation is combined with exercises compared to mobilisation/manipulation alone (Bronfort 2001);
- the advice is in agreement with international guidelines, such as the Danish guideline, the British guideline of the National Institute for Health and Care Excellence (NICE) and the Belgian multidisciplinary guideline of the Belgian Health Care Knowledge Centre.

The difference in effectiveness between manipulation and mobilisation was studied in the current guideline. Manipulation appears to be more effective than mobilisation on pain (small effect) and functionality (clinically relevant effect), both in the short and long term; however, the evidentiary value is low to very low. The guideline panel believes that the decision to mobilise or manipulate the patient should be left to the specific expertise and assessment of the treating therapist based on the low evidentiary value of the interventions. Before initiating mobilisation/manipulation, the therapist informs the patient about potential negative effects of the treatment.

Duration of the complaints

Almost all studies used the duration of the low back pain as a criterion for including or excluding patients. However, when evaluating the results, there were no differences in treatment results between patients with short-term (<4 months) and persistent (>4 months) low back pain. The guideline panel therefore advises not to base the decision on whether or not to administer mobilisations/manipulations on the duration of the complaints, because evidence is lacking for this.

Location of the pain

Most studies included a mix of patients with or without sciatica. Because there were only a few studies in which exclusively patients with or patients without sciatica were included, it was not possible to adequately compare various treatment results for the various groups. There is a lack of evidence for the effect of mobilisations and manipulations on patients with LRS. In addition, patients with LRS have a greater chance of side effects – both serious and non-serious ones – such as considerable increase of pain and motor deficit compared to patients with low back pain without LRS. Due to this, the guideline panel recommends preferably not administering mobilisations or manipulations on patients with LRS.

Patient selection

In almost all included studies, patients were only selected based on the presence of low back pain. However, pain may not be an adequate criterion for whether or not to administer mobilisation and/or manipulation (Maissan 2018), and suboptimal treatment results were achieved. Although there is a chance that the patient characteristics did not align very well with the mechanism of action of the treatment in this study. There is uncertainty about the exact mechanism of action of mobilisations and manipulations (Bialosky 2018; Mintken 2018). More in-depth research is desired on the mechanism of action, but also on the way in which and when mobilisations/manipulations are used in the overall treatment process.

Cost-effectiveness

Four of the five recent systematic reviews about the cost-effectiveness of mobilisations and manipulations found some evidence of the cost-effectiveness of mobilisations and manipulations alone or of these interventions in combination with other treatments (Andronis 2017; Blanchette 2016; Indrakanti 2012; Michaleff 2012; Tsertsvadze 2014). However, Harper (2017) indicates that it's difficult to draw definitive conclusions due to the large variety of intervention methods and control interventions, the various perspectives based on which the costs were assessed (healthcare and/or social), the differences in outcome measures and the organisation and financing of healthcare systems between the various countries.

Note C.4.2 Massage

This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

Reason

The current KNGF Guideline on Low Back Pain recommends considering short massages for alleviating pain in the presence of joint dysfunction or increased muscle tension (KNGF 2013). However, the advice is to be restrained with regard to passive treatment forms, because treatment and supervision must be focused on the patient's self-reliance. The recommendation is substantiated by a Cochrane review that includes 13 randomised controlled studies (Furlan 2008). New literature has been published since then, and the emphasis appears to be even more on an activating approach. Recent systematic review identified 22 guidelines on the treatment of patients with low back pain (Ng 2020, 2021). A recommendation is formulated about massage in seven of the 22 guidelines; massage is recommended in five guidelines and in two guidelines the recommendation about massage is unclear or conflicting (Ng 2020, 2021). The guideline of the National Institute for Health and Care Excellence (NICE) recommends considering massage (as a form of manual therapy), but only as part of a treatment consisting of exercise therapy with or without behavioural therapy (De Campos 2017). The NHG Standard on Non-specific Low Back Pain also stresses that the most important goal of the treatment is aimed at promoting recovery and participation, and that the therapy should have an activating approach (NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017). The recommendations within the guidelines are based on literature in which massage is compared to placebo treatment or with various control interventions. However, the existing guidelines did not look at the evidence in which the added value of massage on exercise therapy was examined, compared with exercise therapy alone.

Clinical question

Is massage, as a supplement to exercise therapy, recommended for patients with low back pain?

Method

In order to answer this clinical question, systematic review was conducted and considerations were analysed according to the GRADE Evidence-to-Decision framework (Alonso-Coello 2016ab).

Conclusions based on the literature

The studies were selected from two Cochrane reviews (Furlan 2008, 2015) and were found with an additional search up to 25 January 2021. Two RCTs were analysed for the response to this clinical question (Bellido-Fernandez 2018; Preyde 2000). These RCTs included a total of 131 patients with low back pain. Both focused on patients with chronic low back pain. None of the studies reported sciatica into the legs. One RCT reported insufficient data to be included in the meta-analysis (Bellido-Fernandez 2018). The results from the other RCT (Preyde 2000) showed that massage as a supplement to exercise therapy has a clinically relevant effect on pain (VAS 0-100; MD 18.20; 95% CI 10.03 to 26.37; low evidentiary value) and physical functioning (RMDQ 0-24; MD 4.17; 95% CI 2.02 to 6.32; low evidentiary value) in patients with chronic low back pain in the short term compared to exercise therapy alone. No RCTs were found that measured the effect on pain and/or physical functioning in the long term.

Conclusions based on the considerations

The results of the systematic review show that massage may have a positive effect on pain and physical functioning in the short term when it is added to exercise therapy. However, given the low evidentiary value, the added value of massage for exercise therapy is still surrounded by many uncertainties.

The literature review by the Cochrane Library showed that massage as singular therapy in patients with subacute and chronic low back pain is more effective on pain and physical functioning than sham therapy, wait list or no treatment in the short term, but not in the long term (low to very low evidentiary value).
Massage is more effective on pain alone compared to other interventions (manipulation, mobilisation, TENS, acupuncture, traction, relaxation therapy, physical therapy, exercise therapy or education), but that effect is not found for physical functioning, either in the short or long term (Furlan 2015).
The guideline panel believes that massage should be strongly discouraged as a stand-alone intervention within physical therapy, given that there is (inter)national and multidisciplinary consensus about the need for an active approach focused on the patient's self-reliance.
The guideline panel believes that short-term massage can be used for patients with a strong preference for or high expectations or convictions regarding massage, but only with the goal of creating acceptance of an active approach and achieving exercise and self-reliance on the part of the patient.

Note C.4.3 Transcutaneous electrical nerve stimulation (TENS) and interference

This non-exercise therapy intervention is outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

Reason

TENS and interference are not recommended in the 2013 KNGF guideline (KNGF 2013). This is based on the results of two systematic reviews. However, since publication of the guideline, various RCTs have been published that evaluated the effectiveness of TENS and interference in patients with low back pain, which necessitated an update of the literature review. Furthermore, some practical experience has shown – despite the negative recommendation in the guideline – that TENS and interference are nevertheless administered with a positive result in some cases, such as in patients with radicular pain or as a prerequisite for exercise therapy, to alleviate pain and in patients who do not want to or are unable to undergo exercise therapy (yet).

Clinical questions

- Are TENS and interference recommended for patients with low back pain?
- Are TENS and interference recommended as a supplement to exercise therapy for patients with low back pain?

Method

In order to answer these clinical questions, systematic review was conducted and considerations were analysed according to the GRADE Evidence-to-Decision framework (Alonso-Coello 2016a, Alonso-Coello 2016b).

Conclusions based on the literature

Suitable studies were selected from the guideline of the National Institute for Health and Care Excellence (NICE) (search up to December 2015) and from the results of an additional search (up to 29 April 2020).

TENS

The 11 included studies about TENS included a total of 652 patients with low back pain. The identified RCTs all focused on patients with chronic low back pain. No RCTs were found that evaluated the effectiveness of TENS in patients with acute or subacute low back pain. The majority of the RCTs included both patients with low back pain with sciatica into the legs and patients with low back pain alone. The evidentiary value for the effect of TENS on pain and physical functioning in the short term is very low for all comparisons that are described below. Based on this, the guideline panel concludes that the effects of TENS are hedged by much uncertainty and that the results should be interpreted with caution.

Systematic review shows a big effect of TENS on pain (VAS 0–100; MD 23.16; 95% CI −3.78 to 50.10) and physical functioning (SMD 0.70; 95% CI −0.04 to 1.44) in patients with chronic low back pain in the short term compared to doing nothing/waiting/wait list. When comparing TENS with a placebo or with sham TENS, the effects on pain (VAS 0–100; MD 7.17; 95% CI −2.78 to 17.11) and physical functioning (ODI 0–100; MD 2.21; 95% CI −6.36 to 14.78) are small in the short term.

TENS compared to another intervention within the scope of this guideline, in this case usual care or exercise therapy, shows a small effect on pain (VAS 0–100; MD −8.09; 95% CI −29.11 to 12.93) and a moderate effect on physical functioning (MD −14.28; 95% CI −17.12 to −11.44) in the short term in favour of usual care or exercise therapy, measured in patients with chronic low back pain without sciatica into the legs.

When TENS is added to exercise therapy and is compared to exercise therapy alone, the short-term effects on pain are moderate (VAS 0–100; MD 11.06; 95% CI −6.45 to 28.57) and are small on physical functioning (ODI 0–100; MD 1.44; 95% CI −11.09 to 13.98). No RCTs were found that studied the effect on pain and/or physical functioning in the long term.

Only one RCT reported about possible adverse effects of TENS, whereby it was noted that no complications of the treatment were observed.

Interference

The six included RCTs about interference included a total of 569 patients with low back pain. The evidentiary value for pain and physical functioning was low to very low for all comparisons; the effects of interference in patients with low back pain are hedged by much uncertainty and should be interpreted with caution.

Systematic review shows that the desired effects of interference on both pain (VAS 0–100; MD 44.10; 95% CI 34.20 to 54.00) and physical functioning (RMDQ 0–24; MD 7.51; 95% CI 5.50 to 9.42) are large in the short term compared to not doing anything, but compared to placebo/sham, interference has a moderate effect on pain (VAS 0–100; MD 11.66; 95% CI −8.12 to 31.43) and a small effect on physical functioning (RMDQ 0–24; MD 1.15; CI 1.56 to 3.86). When comparing interference with usual care or manual therapy, the short-term effects on pain are moderate (VAS 0–100; MD 15.50; 95% CI 6.13 to 24.87) and the long-term effects are small (VAS 0–100; MD 8.30; 95% CI −1.06 to 17.66). The effects on physical functioning are small in both the short term (ODI 0–100; MD 3.58; 95% CI −4.56 to 11.72) and the long term (RMDQ 0–24; MD 1.85; 95% CI 0.08 to 4.62). The effects of interference as a supplement to exercise therapy are large in the short term both on pain (VAS 0–100; MD 31.40; 95% CI 28.16 to 34.64) and physical functioning (ODI 0–100; MD 27.92; 95% CI 23.88 to 31.96).

Conclusions based on the considerations

The guideline panel strongly discourages TENS and interference, either as a supplement to exercise therapy or alone, for patients with low back pain with or without sciatica into the legs. The guideline panel arrived at this decision based on the following considerations:

- The desired effects of TENS and interference in patients with chronic low back pain on pain and physical functioning in the short term have a very low evidentiary value and vary per outcome measure and comparison.
- No literature was found about the adverse effects of TENS and interference.
- The guideline panel estimates that the majority of patients attach little value to the use of TENS and interference, given the uncertainty about their benefit.
- Investments for the procurement of equipment are not deemed to be justified.
- The guideline stresses an active approach, in order to encourage an active lifestyle and the patient's self-reliance. TENS and interference do not fit within this active approach.
- The recommendation to discourage use of TENS and interference is aligned with (inter)national guidelines (including the 2013 KNGF Guideline on Low Back Pain, the guideline of the National Institute for Health and Care Excellence (NICE), the guideline of the Belgian Health Care Knowledge Centre (KCE) and the guideline of the American College of Physicians).
- The recommendation to discourage use of TENS and interference is also aligned with a recent overview article by the Cochrane Collaboration, which concludes that it is very uncertain whether TENS is beneficial or harmful to people with chronic pain (Gibson 2019).

A benefit of exercise therapy was only found in one RCT about the effectiveness of TENS in patients with low back pain with sciatica into the legs. No RCTs were found that evaluated the effectiveness of interference in patients with low back pain with sciatica into the legs. The guideline panel sees no reason to recommend TENS and interference for patients with low back pain with or without sciatica into the legs.

Note C.5 Completion of the treatment

Reason

The period during which the therapy is offered depends on the start and stop criteria. The start criteria are described in B.2 'Indications and treatment profiles'. This section describes when the treatment is terminated and provides information about information exchange with the referrer.

Clinical question

Which stop criteria are employed for ending the treatment period?

Method

To answer the clinical question, literature was used – in consultation with the guideline panel – that was identified based on a systemic search for evidence-based guidelines and systematic reviews. This search was supplemented by information from national guidelines for low back pain. The recommendations were compiled in accordance with the 2019 KNGF Guideline Methodology (KNGF 2019).

Conclusions based on the literature

No systematic reviews or (inter)national evidence-based guidelines were identified with a recommendation about when the treatment should be stopped. The 2013 KNGF guideline and an appendix to the NHG Standard on Non-specific Low Back Pain contain a recommendation to limit the number of treatment sessions to a maximum of three for a normal course of low back pain (NHG Guideline Panel for the Standard on Non-specific Low Back Pain 2017; KNGF 2013).

Conclusions based on the considerations

The guideline panel agrees with the stop criteria that were compiled in a previous guideline project (KNGF 2020) and stop criteria that were formulated within the Physical Therapist Professional Profile (KNGF 2021). The stop criteria as formulated in the Practice Guideline are commensurate with the patient's context and are aligned with the therapy's goals. The guideline panel adds the following criteria to this:

- The need for assistance can change during the therapy.
- The patient can indicate wanting to stop him/herself e.g. for a personal reason, reasons stemming from the patient's social context and for financial reasons.
- The lack of motivation to take personal responsibility especially concerns physical training and/or being physically active outside of the therapy setting.

Follow-up care

The guideline panel believes it is important for the physical therapist or exercise therapist to encourage the patient to continue exercising and moving independently also after the treatment period. The guideline panel also deems it important for the physical therapist or exercise therapist to repeat the information and advice about recovery-impeding and facilitating factors when the therapy ends, in order to maintain the treatment effects as long as possible, and to prevent recurring complaints.

Information exchange with the referrer

During the course of the treatment, there are various times in the care process when the physical therapist or exercise therapist exchanges information with the referrer. The Guideline on Information Exchange between General Practitioner and Paramedical Professional (HASP-paramedicus) contains recommendations for this information exchange based on consensus by the guideline panel. The recommendations for the information exchange from the paramedical professional to the physician have been incorporated into the guideline.

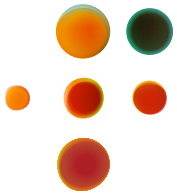
File-kee ping

For information on file-keeping, see the current KNGF Guideline on Physiotherapeutic File-keeping (Royal Dutch Society for Physical Therapy 2019), the VvOCM Guideline on Reporting (Association of Cesar and Mensendieck Exercise Therapists 2019) and the Guideline on Information Exchange between General Practitioner and Paramedical Professional (HASP-paramedicus).

Colophon

Final editing: Tertius – Redactie en organisatie, Houten
Creative concept and design: C10 Ontwerp, The Hague

The KNGF aims to create the conditions in which high-quality physiotherapeutic care can be provided that is accessible to the entire Dutch population, whilst recognising the professional expertise of the physical therapist.
The KNGF represents the professional, social and economic interests of over 17,000 registered physical therapists.



The physical therapists of the Netherlands

Dutch Society for Physical Therapy
Association of Cesar and Mensendieck Exercise Therapists