

An updated overview of clinical guidelines for the management of non-specific low back pain in primary care

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Abstract The aim of this study was to present and compare the content of (inter)national clinical guidelines for the management of low back pain. To rationalise the management of low back pain, evidence-based clinical guidelines have been issued in many countries. Given that the available scientific evidence is the same, irrespective of the country, one would expect these guidelines to include more or less similar recommendations regarding diagnosis and treatment. We updated a previous review that included clinical guidelines published up to and including the year 2000. Guidelines were included that met the following criteria: the target group consisted mainly of primary health care professionals, and the guideline was published in English, German, Finnish, Spanish, Norwegian, or Dutch. Only one guideline per country was included: the one most recently published. This updated review includes national clinical guidelines from 13 countries and 2 international clinical guidelines from Europe published from 2000 until 2008. The content of the guidelines appeared to be quite similar regarding the diagnostic classification (diagnostic triage) and the use of diagnostic and therapeutic interventions.

Consistent features for acute low back pain were the early and gradual activation of patients, the discouragement of prescribed bed rest and the recognition of psychosocial factors as risk factors for chronicity. For chronic low back pain, consistent features included supervised exercises, cognitive behavioural therapy and multidisciplinary treatment. However, there are some discrepancies for recommendations regarding spinal manipulation and drug treatment for acute and chronic low back pain. The comparison of international clinical guidelines for the management of low back pain showed that diagnostic and therapeutic recommendations are generally similar. There are also some differences which may be due to a lack of strong evidence regarding these topics or due to differences in local health care systems. The implementation of these clinical guidelines remains a challenge for clinical practice and research.

Keywords Low back pain · Clinical guidelines · Review · Diagnosis · Treatment

Introduction

Low back pain remains a condition with a relatively high incidence and prevalence. Following a new episode, the pain typically improves substantially but does not resolve completely during the first 4–6 weeks. In most people the pain and associated disability persist for months; however, only a small proportion remains severely disabled [1]. For those whose pain does resolve completely, recurrence during the next 12 months is not uncommon [2, 3].

There is a wide acceptance that the management of low back pain should begin in primary care. The challenge for primary care clinicians is that back pain is but one of many

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conditions that they manage. For example while back pain, in absolute numbers, is the eighth most common condition managed by Australian GPs, it only accounts for 1.8% of their case load [4]. To assist primary care practitioners to provide care that is aligned with the best evidence, clinical practice guidelines have been produced in many countries around the world.

The first low back pain guideline was published in 1987 by the Quebec Task Force with authors pointing to the absence of high-quality evidence to guide decision making [5]. Since that time there has been a strong growth in research addressing diagnosis and prognosis but especially research on therapy. As an example of this growth, at the time of the Spitzer guideline [5] there were only 108 randomised controlled trials evaluating physiotherapy treatments for low back pain but as at April 2009 there were 958.¹ The Cochrane database (Central) currently lists more than 2500 controlled trials evaluating treatment for back and neck pain. The evidence from these trials for most interventions is summarised in systematic reviews and meta-analysis. The Cochrane Back Review Group, for example, has now published 32 systematic reviews of randomised controlled trials evaluating interventions for low back pain. In the near future, systematic reviews of studies evaluating diagnostic intervention for low back pain will also be included in the Cochrane Library.

This dramatic growth in research would be a comfort to those who were members of the original Quebec Task Force but perhaps a challenge to those who served on committees for later guidelines. With a large and ever increasing research base to inform guidelines two potential problems arise. The first and most obvious is that the recommendations in the guidelines may become out of date. The second is that with a wealth of information to consider, the various committees producing guidelines may produce quite different treatment recommendations. At the same time one can argue that if more precise and valid information becomes available recommendations will become more similar. A previous systematic review of clinical practice guidelines was conducted in 2001 [6]. In that review we assessed the available clinical guidelines from 11 countries and concluded that the guidelines provided generally similar recommendations regarding the diagnostic classification (diagnostic triage) and the use of diagnostic and therapeutic interventions. Consistent features were the early and gradual activation of patients, the discouragement of prescribed bed rest, and the recognition of psychosocial factors as risk factors for chronicity. However, there were discrepancies for recommendations

regarding exercise therapy, spinal manipulation, muscle relaxants, and patient information.

Bouwmeester et al. [7] concluded recently that the quality of mono- and multidisciplinary clinical guidelines for the management of low back pain, as measured with the AGREE instrument has improved over time. The present article focuses on the actual content of national clinical guidelines on low back pain which have been issued since 2001. These guidelines are compared regarding the content of their recommendations, the target group, the guideline committee and its procedures, and the extent to which the recommendations were based on the available literature (the scientific evidence). We also highlight any changes in recommendations that have occurred over time in comparison with our previous review [6].

Methods

Clinical guidelines were searched using electronic databases covering the period 2000–2008: Medline (key words: low back pain, clinical guidelines), PEDro (key words: low back pain, practice guidelines, combined with AND), National Guideline Clearinghouse (www.guideline.gov; key word: low back pain), and National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk; key word: low back pain). Guidelines used in the previous review were checked for updates. We also checked the content and reference list of relevant reviews on guidelines, included a search on the Web of Science citation index for articles citing the previous review and asked experts in the field. To be included in this review, the guidelines had to meet the following criteria: (1) the guideline concerned the diagnosis and clinical management of low back pain, (2) the guideline was targeted at a multidisciplinary audience in the primary care setting, and (3) the guideline was available in English, German, Finnish, Spanish, Norwegian or Dutch because documents in these languages could be read by the reviewers. Only one guideline was included per country unless there were separate guidelines for acute and chronic low back pain. Where more than one eligible guideline was available for a country, we included the most recent guideline issued by a national body. Guidelines from the following countries/regions and agencies (year of publication) were included:

Australia, National Health and Medical Research Council (2003) [8];

Austria, Center for Excellence for Orthopaedic Pain Management Speising (2007) [9];

Canada, Clinic on Low back Pain in Interdisciplinary Practice (2007) [10];

Europe, COST B13 Working Group on Guidelines for the Management of Acute Low Back Pain in Primary Care (2004) [11];

¹ Based upon search of PEDro database April 29, 2009.

Europe, COST B13 Working Group on Guidelines for the Management of Chronic Low Back Pain in Primary Care (2004) [12];

Finland, Working group by the Finnish Medical Society Duodecim and the Societas Medicinae Physicalis et Rehabilitationis Fenniae. Duodecim (2008) [13];

France, Agence Nationale d'Accreditation et d'Evaluation en Sante (2000) [14];

Germany, Drug Committee of the German Medical Society (2007) [15];

Italy, Italian Scientific Spine Institute (2006) [16];

New Zealand, New Zealand Guidelines Group (2004) [17];

Norway, Formi & Sosial- og helsedirektoratet (2007) [18];

Spain, the Spanish Back Pain Research Network (2005) [19];

The Netherlands, The Dutch Institute for Healthcare Improvement (CBO) (2003) [20];

United Kingdom, National Health Service (2008) [21]; and

United States, American College of Physicians and the American Pain Society (2007) [22].

Data regarding the diagnostic and therapeutic recommendations as well as background information of the guideline process were extracted from the guidelines by four of the authors, each assessing 3–4 guidelines. The Finnish and Norwegian guidelines were assessed by colleagues with relevant language skills from The Netherlands and Finland. The focus was on the process of guideline development and the recommendations for diagnosis and treatment. We used the same data categories as in the previous review to facilitate comparisons (see Tables 1, 2, 3).

Results

Patient population

Each of the guidelines considered the duration of symptoms but they vary in their scope and definitions. For example, the guidelines from Australia and New Zealand focus on acute low back pain whereas the guidelines from Austria and Germany consider acute, subacute, chronic and recurrent low back pain. The cut-off for chronic is not always specified but when it was, 12 weeks was used. Sometimes the word persistent rather than chronic was used. Two guidelines (Austrian and German) provide recommendations for recurrent low back pain but do not explicitly define 'recurrent'.

Diagnostic recommendations

Table 1 compares the diagnostic classification and the recommendations on diagnostic procedures in the various guidelines. All guidelines recommend a diagnostic triage where patients are classified as having (2) non-specific low back pain, (2) suspected or confirmed serious pathology ('red flag' conditions such as tumour, infection or fracture) and (3) radicular syndrome. Some guidelines, e.g. the Australian and New Zealand guidelines, do not distinguish between non-specific low back pain and radicular syndrome. The German guideline also classifies a group of patients who are at risk for chronicity, based on 'yellow flags'.

All guidelines are consistent in their recommendations that diagnostic procedures should focus on the identification of red flags and the exclusion of specific diseases (sometimes including radicular syndrome). Red flags include, for example, age at onset (<20 or >55 years), significant trauma, unexplained weight loss and widespread neurologic changes. The types of physical examination and physical tests that are recommended show some variation. Some, such as the European guideline, limit the examination to a neurological screen whereas others advocate a more comprehensive musculoskeletal (including inspection, range of motion/spinal mobility, palpation, and functional limitation) and neurological examination. The components of the neurologic screening are not always explicit but where they are, comprise testing of strength, reflexes, sensation and straight leg raising.

None of the guidelines recommend routine use of imaging, with imaging recommended at the initial visit only for cases of suspected serious pathology (e.g. Australian, European) or where the proposed treatment (e.g. manipulation) requires the exclusion of a specific cause of low back pain (French). Imaging is sometimes recommended where sufficient progress is not being made but the time cut-off varies from 4 to 7 weeks. Guidelines often recommend MRI in cases with red flags (e.g. European, Finland, Germany).

All guidelines mention psychosocial factors associated with poor prognosis with some describing them as 'yellow flags'. There is, however, considerable variation in the amount of details given about how to assess 'yellow flags' or the optimal timing of the assessment. The Canadian and the New Zealand guidelines provide specific tools for identifying yellow flags and clear guidelines for what should be done once yellow flags are identified.

Table 1 Clinical guidelines recommendations regarding diagnosis of low back pain

Country	Patient population	Diagnostic classification	Physical examination	Imaging	Psychosocial factors
Australia (2003)	Acute (<3 months)	Non-specific low back pain (divided into acute, subacute and chronic) Specific low back pain	Conduct physical examination to assess for the presence of serious conditions Neurological examination in case it is suspected. (Physical examination such as inspection, range of motion and posture may have low reliability and validity and should be used with caution)	Not recommended unless alerting features of serious conditions are present	Yellow flags associated with the progression from acute to chronic should be assessed early to facilitate intervention
Austria (2007)	Acute (0–6 week), subacute (6–12 week) chronic (>12 week), and recurrent	Non-specific LBP Specific LBP (based on list of red flags) Including high-grade spondylolisthesis, facet arthrosis, severe degenerative disc disease	Inspection, palpation, range of motion testing of lumbar spine, neurological screening (strength, reflexes, sensibility, SLR)	Not useful in the first 4 weeks of an episode After 4–6 weeks may be indicated in search for a specific cause	Evaluate psychosocial factors in patients who do not show improvement over time (with recommended treatment) and in patients with recurrent LBP
Canada (2007)	Acute, subacute and persistent	Simple back pain Back pain with neurological involvement Back Pain with suspected serious pathologies All divided into acute, subacute and persistent	Physical examination in patients with back pain and neurological involvement includes SLR, motor, sensitivity, reflex signs	Not recommended for simple low back pain but recommended for pain with neurological involvement and suspected serious pathology. MRI and CT scans recommended if surgery is in question	Assess patients' perceived disability and probability to return to usual activity after 4 weeks of disability or at first consultation if patient has a history of long-lasting back-related disability (Symptom Check List Back Pain Prediction Model)
Europe (2006)	Acute (<6 weeks) and subacute (6–12 weeks) LBP	Serious spinal pathology Nerve root pain/radicular pain Non-specific low back pain	Physical assessment including neurological screening when appropriate	Diagnostic imaging tests (including X-rays, CT and MRI) are not routinely indicated for non-specific low back pain	Assess for psychosocial factors and review them in detail if there is no improvement
Europe (2006)	Chronic LBP (>12 weeks)	Specific spinal pathology Nerve root pain/radicular pain Non-specific low back pain	Diagnostic triage, neuro-screening 'We cannot recommend spinal palpatory and range of motion tests in the diagnosis of chronic low back pain'	No radiographic imaging MRI in case of red flags X-ray in case of suspected structural deformities	'We recommend the assessment of prognostic factors (yellow flags) in patients with chronic low back pain'

Table 1 continued

Country	Patient population	Diagnostic classification	Physical examination	Imaging	Psychosocial factors
Finland (2008)	Acute, subacute and chronic LBP	Non-specific LBP Nerve root dysfunction (sciatic syndrome, intermittent claudication) Possible serious or specific disease	Inspection, palpation, spinal mobility (flexion), SLR-test, strength, reflexes	No imaging in first 6 weeks Plain lumbar X-ray is basic investigation before other imaging studies MRI is first-line imaging investigation if special examinations are needed	A list of psychosocial factors (yellow flags) is included in the guideline Assess illness behaviour, depression in subacute LBP
France (2000)	Acute low back pain <3 months Chronic “uncomplicated” low back pain >3 months	Acute & Chronic: Non-specific low back pain So-called symptomatic acute low back pain with or without sciatica (fracture, neoplasm, infection, inflammatory disease) Diagnostic and therapeutic emergencies (hyperalgesic sciatica, paralyzing sciatica, cauda equina syndrome)	Acute: To rule out “so-called symptomatic acute low back pain” or emergencies Rating of muscle strength Chronic: Musculoskeletal and neurological examination to identify specific cause Assessment of function, anxiety and/or depression using validated measure	Acute: Not to be ordered in the first 7 weeks except when the treatment selected (manipulation, infiltration) requires formal elimination of specific form of low back pain Chronic: X-rays not repeated. CT/MRI only in exceptional circumstances	Acute and Chronic: Recommended to assess psychosocial factors
Germany (2007)	Acute, subacute, chronic/recurrent LBP	Non-specific LBP Radicular pain Specific LBP (based on red flags) Patients at risk for chronicity (based on yellow flags)	Inspection, palpation, neurological screening; reflexes, SLR/Lasegue, sensibility, strength Further investigation (e.g. lab testing) is based on red flags	X-ray not useful in acute non-specific LBP CT, MRI only in cases with suspected radicular pain, or stenosis, or specific pathology such as tumours After 6 weeks persistent pain X-ray may be indicated or after 6–8 weeks an MRI	Evaluate risk factors for chronicity (yellow flags); including biological, psychological, occupational, lifestyle, and iatrogenic factors
Italy (2006)	Acute, subacute and chronic LBP	Non-specific LBP Specific LBP Sciatica	Pain/functional limitation on trunk movement Palpation Postural evaluation Neurological exam is recommended (SLR, sensibility)	Useless for non-specific acute LBP Option after 4–6 weeks if surgery is indicated (sciatica)	Screening after 2 weeks: yellow flags, Waddell test (for pain behaviour)

Table 1 continued

Country	Patient population	Diagnostic classification	Physical examination	Imaging	Psychosocial factors
New Zealand (2004)	Acute LBP (<3 months)	Non-specific LBP Specific pathologic change	Neurological screening Establish degree of functional limitation caused by the pain	Investigations in first 4–6 weeks do not provide clinical benefit unless Red Flags present There are risks associated with unnecessary radiology	Screen for yellow flags with the Acute Low Back Pain Screening Questionnaire, and if at risk, clinical assessment
Norway (2007)	Acute and subacute (<3 months) Chronic (>3 months)	Non-specific LBP Radicular pain Serious pathologies/acute neurological conditions (Cauda equina syndrome)	Inspection, posture, deformity, Spinal mobility, including finger-to-floor distance, Neurological screening (SLR/Lasegue) if radicular pain is suspected	Not recommended in acute, subacute chronic LBP and radicular pain in the absence of red flags, Recommended in case of red flag First choice is MRI	A list of yellow flags is presented as risk factors for chronicity, sick leave
Spain (2005)	Non-specific acute, subacute and chronic	Specific spinal pathology Nerve root pain/radicular pain Non-specific low back pain	Clinical history, red flags. Do not recommend palpation and tests of intervertebral mobility	Not useful in non-specific LBP; X-rays, CT and MRI use only in case of red flags	Assess psychological factors in 2–6 weeks after treatment if not improving. Assess physiological factors as prognostic factor only
The Netherlands (2003)	Acute (0–12 week) and chronic (>12 week) LBP	Non-specific LBP Specific LBP (based on a list of red flags)	SLR-test, neurological inspection; loss of motor control, sensibility, miction. Palpation of spine, Inspection of lumbar kyphosis or flattened lumbar lordosis	Not useful in non-specific acute LBP	Assessment of psychosocial factors (yellow flags) is recommended. These include emotional reaction, cognitions and behaviour
United Kingdom (2008)	Acute <6 weeks, subacute 6–12 weeks, chronic >3 months	Non-specific low back pain: Mechanical low back pain Inflammatory low back pain and stiffness Serious pathology	Rule out serious pathology (identify red flags) Confirm pain is in the lower back, is mechanical, not inflammatory	Does not inform management of non-specific low back pain but may be indicated to rule in/out serious pathologies	Recognise and manage psychosocial barriers (yellow flags) to recovery
United States (2007)	Acute and chronic LBP	Non-specific LBP LBP due to specific causes LBP-Radiculopathy/Spinal Stenosis	Neurological screening (including SLR, strength, reflexes, sensory symptoms)	Only where progressive neurological or serious pathology is suspected Discouraged for non-specific LBP Recommended for radiculopathy or spinal stenosis only if patients are potential candidates for further intervention	Assessment of psychosocial factors strongly recommended

Table 1 continued

Country	Patient population	Diagnostic classification	Physical examination	Imaging	Psychosocial factors
<i>Most apparent changes since 2001</i>					
Addition of guidelines from countries such as Austria, Canada, France, Italy, Norway, Spain and a unified one from Europe	More countries (UK, US) now include recommendations for chronic LBP in addition to acute LBP. Germany now includes subacute and recurrent LBP	Almost no change in diagnostic classifications used in the guidelines	Almost no change in recommended types of physical examination	In some guidelines (Finland, Germany) now more explicit statements regarding the use of CT and MRI	In a few guidelines (Netherlands, US) the measurement of yellow flags are now more strongly recommended. In Germany the assessments is now recommended at a much earlier stage

Summary of Common Recommendations for Diagnosis of Low back pain

- * Diagnostic triage (non-specific low back pain, radicular syndrome, serious pathology).
- * Screen for serious pathology using red flags.
- * Physical examination for neurologic screening (including straight leg raising test).
- * Consider psychosocial factors (yellow flags) if there is no improvement.
- * Routine imaging not indicated for non-specific low back pain.

Therapeutic recommendations

Table 2 compares therapeutic recommendations given in the various guidelines. Patient advice and information is recommended in all guidelines. The common message is that patients should be reassured that they do not have a serious disease, that they should stay as active as possible and progressively increase their activity levels. Compared with the previous review, the current guidelines increasingly mention early return to work (despite having low back pain) in their list of recommendations.

Recommendations for the prescription of medication are generally consistent. Paracetamol/acetaminophen is usually recommended as a first choice because of the lower incidence of gastrointestinal side effects. Nonsteroidal anti-inflammatory drugs are the second choice in cases where paracetamol is not sufficient. There is some variation between guidelines with regard to recommendations for opioids, muscle relaxants, steroids, antidepressant and anticonvulsive medication as co-medication for pain relief. Where the mode of consumption of analgesics is described, time-contingent rather than pain-contingent use, is advocated.

There is now broad consensus that bed rest should be discouraged as a treatment for low back pain. Some guidelines state that if bed rest is indicated because of severity of pain, then it should not be advised for more than 2 days (e.g., Germany, New Zealand, Spain, Norway). The Italian guideline advises 2–4 days of bed rest for major sciatica but does clearly describe how major sciatica differs from sciatica where bed rest is contraindicated.

There is also consensus that a supervised exercise programme (as distinct from encouraging resumption of normal activity) is not indicated for acute low back pain. Those guidelines that consider subacute and chronic low back pain recommend exercise but note that there is no evidence that one form of exercise is superior to another. The European guideline advises against exercise that requires expensive training and machines. The one area of

Table 2 Clinical guidelines recommendations regarding treatment of low back pain

Country	Education	Medication	Exercises	Manipulation	Bed rest	Referral to specialist
Australia (2003) [8]	Provide information, assurance and advice to resume normal activity (stay active)	First choice paracetamol, second choice NSAIDs, third choice oral opioids Not recommended: anticonvulsants, antidepressants, muscle relaxants	There is conflicting evidence of the effect of exercises but evidence shows that it is no better than usual care	Conflicting evidence of spinal manipulation versus placebo in first 2–4 weeks	Not advisable	When alerting features (red flags) or serious conditions are present
Austria (2007) [9]	Acute LBP: expect a favourable course; maintain normal daily activities	Acute LBP: (1) Paracetamol; (2) NSAIDs 3) muscle relaxants or weak opioids as last option Chronic LBP: Options: NSAIDs/Coxibs; Opioids; Antidepressant; muscle relaxants; Anti-convulsion medication (for radicular pain), Capsaicin Only for short periods: (1) paracetamol, (2) tramadol or NSAID, (3) opioids	Acute LBP: Not specifically mentioned in the guideline Chronic LBP: Exercise therapy recommended as monotherapy or in combination with back school, massage	Acute LBP: Optional for patients who do not return to normal level of activity within the first weeks Chronic LBP: Optional for patients with persistent problems with performing daily activities	Acute LBP: Avoid bedrest (but if necessary, only for a short period)	In case of suspected specific LBP, Surgery is optional only after 2 years of recommended conservative treatment, persisting complaints and with a surgical indication
Canada (2007) [10]	Reassurance and advice to return to work and usual activities	NSAIDs, muscle relaxants and analgesics for acute. Low evidence for NSAIDs and analgesics for subacute pain	Strengthening exercises, extension exercises and specific exercises are not recommended for acute but recommended for subacute and chronic with no superior form of exercise	Recommended for short-term pain reduction for acute. Recommended with low evidence for subacute and chronic	Not recommended	Refer patients with neurological signs or symptoms if functional deficits are persistent or deteriorating after 4 weeks
Europe (2006) (acute) [11]	Reassure and advise patients to stay active and continue normal daily activities including work if possible	Prescribe medication, if necessary for pain relief; Preferably to be taken at regular intervals; first choice paracetamol, second choice NSAIDs. Third choice consider short course of muscle relaxants on its own or added to NSAIDs	Do not advise specific exercises (for example strengthening, stretching, flexion, and extension exercises) for acute low back pain	Consider (referral for) spinal manipulation for patients who are failing to return to normal activities	Do not prescribe bed rest as a treatment	Refer patients with neurological symptoms such as cauda equina syndrome

Table 2 continued

Country	Education	Medication	Exercises	Manipulation	Bed rest	Referral to specialist
Europe (2006) (chronic) [12]	Advice and reassurance to return to normal activities	Recommend use of NSAID for short term pain relief and opioids in case patient is not responding to other treatment. Consider the use of noradrenergic or serotonergic antidepressants as co-medication for pain relief	Supervised exercise therapy is advisable specifically approaches that don't require expensive training and machines. Cognitive behavioural approach including graded activity and group therapy are advisable	Recommend short course of spinal manipulation/mobilisation	Discouraged	Most invasive treatments not recommended Surgery not recommended unless in carefully selected patients, 2 years of all recommended conservative treatments including multidisciplinary approaches with combined programmes of cognitive intervention and exercises have failed
Finland (2008) [13]	Benign nature of condition; prognosis is good; continue ordinary daily activities. Back pain may recur but even then recovery is usually good	Acute/Subacute LBP: (1) paracetamol, (2) NSAIDs, (3) adding a weak opiate to paracetamol/NSAID. (4) muscle relaxants Antidepressant only if clear depression. Benzodiazepines not recommended Chronic LBP Analgesics used periodically, be aware of side effect of NSAIDs (gastrointestinal, cardiovascular)	Acute LBP: Active exercises not effective in early stages Light exercises (e.g. walking) can be recommended Subacute: gradually increasing exercises Chronic: Intensive training effective for pain and function	Acute LBP: some effectiveness Similar effectiveness as GP in subacute LBP Chronic LBP: similar effectiveness as GP, analgesics, physiotherapy, etc.	Avoid bedrest; a short period of bedrest may be necessary due to intense back pain, but bedrest must not be considered as a treatment of back problems	Immediate referral: Cauda equina syndrome, sudden massive paresis, excruciating pain Referral: serious, non urgent conditions Multidisciplinary (bio-psycho-social) rehabilitation focused on improving functional capacity
France (2000) [14]	Short-term education about the back, in groups, is not beneficial	Acute & Chronic: Regular simple analgesics, non-steroidal anti-inflammatory drugs and muscle relaxants. No evidence for systemic corticosteroids Chronic: Additional recommendations for: acetylsalicylic acid, Level II following failure to respond to Level I and Level III (strong opioids) on a case by case basis. Trazepam, Tricyclic antidepressants	Acute: Flexion exercises have been not been shown to be of benefit. No recommendation on extension exercises Chronic: Physical exercise is recommended, no particular type is advocated	Acute & Chronic: Provides short-term benefit. No recommendation for one form of manual therapy over another	Acute and Chronic: Not recommended	Acute: No recommendation Chronic: Recommended physiotherapy/behavioural therapy/multidisciplinary programme if non-response to first-line care

Table 2 continued

Country	Education	Medication	Exercises	Manipulation	Bed rest	Referral to specialist
Germany (2007) [15]	Acute LBP: stimulate daily activities, explain moving is not dangerous, Chronic LBP more intense psychotherapy indicated in case of psychological co-morbidity	Acute and Chronic LBP: (1) paracetamol, (2) NSAIDs (oral or topical), (3) Muscle relaxants (in cases with muscle spasms, (4) Opioids	Acute LBP: exercise therapy not effective Subacute and Chronic LBP: Exercise therapy well supported by evidence	Acute LBP: Optional within the first 4–6 weeks Chronic LBP: option if shortlasting	Maximum of 2 days bedrest	Immediate surgery indicated for cauda equina syndrome Optional referral for surgery: therapy resistant (>6 weeks) + signs of nerve root compression Surgery may be an option if after 2 years conservative treatment, including biopsychosocial treatment programme was unsuccessful
Italy (2006) [16]	Give information and reassurance about possible cause, provoking factors, risk factors, and structural or postural alterations, reassurance about good prognosis, keep active and if possible, stay at work	Paracetamol as preferred drug NSAIDs recommended Muscle relaxants no additional effect Steroids not recommended in acute LBP, but can be useful for a short time in sciatica Tramadol and adding light opioid to paracetamol may be useful for sciatica	Acute LBP No specific exercises recommended Chronic LBP Individual specific exercises	After 2–3 weeks and before 6 weeks, prescribed by physicians, done by trained therapists Chronic LBP: Consider for pain relief	Discouraged for acute LBP, except 2–4 days for major sciatica Contraindicated for sciatica No recommended in Chronic LBP	Radiculopathy and suspicion of specific causes Multidisciplinary psychosocial intervention for patients at high risk of chronicity and chronic pain
New Zealand (2004) [17]	Advise to stay active and working, or early return to work, reassurance Education pamphlets not helpful	Paracetamol and NSAIDs recommended Opiates or diazepam may be harmful	Specific back exercises not helpful	First 4–6 weeks only May provide short-term symptom control	Bed rest >2 days harmful	Suspicion of specific causes (red flags), cauda equina syndrome, or after 4–8 weeks
Norway (2007) [18]	Stay active, return to normal activity including work asap,	(1) Paracetamol (2) NSAID (3) Paracetamol + opioid or Tramadol (4) Antidepressants in cases with depression	No specific exercises in the first weeks In chronic LBP exercises are recommended	After 1–2 weeks for pain reduction and improvement of function (for small to moderate effects)	Not recommended In rare cases, not longer than 2–3 days	Referral within primary care for cognitive behavioural treatment is optional Referral for surgical intervention after 2 years' LBP

Table 2 continued

Country	Education	Medication	Exercises	Manipulation	Bed rest	Referral to specialist
Spain (2005) [19]	Reassurance and advice to stay active	Paracetamol every 6 h, can also be associated with opioids and NSAID although the last one should not be prescribed for longer than 3 months Opioids are indicated for patients with high levels of pain who did not improve with usual care	Exercise as far as pain allows including work activities. As there is no evidence for any specific type of exercise, choose the one that patients prefer. Not indicated for patients with pain for less than 6 weeks	Not recommended	Discouraged unless patient can not adopt another posture. Then bed rest for the maximum of 48 h	Refer patient in case of red flags
The Netherlands (2003) [20]	Acute and Chronic LBP: Stay active as much as possible (despite the pain), increase activity level on a time contingent basis	Acute LBP: (1) Paracetamol (2) NSAIDs, (3) muscle relaxants or weak opioids or combinations with paracetamol/NSAIDs as last option due to side effects Chronic LBP: Only for short periods: (1) Paracetamol, (2) Tramadol or NSAID, (3) Opioids	Acute LBP: Consider after 4–6 weeks for patients who do not improve their functioning Chronic LBP: Recommended are time-contingent, varying and supervised exercises focused at improving function	Acute and Chronic LBP: Option as part of an activating strategy for patients who do not show a favourable course	Acute and Chronic LBP: Avoid bedrest	Chronic LBP: Refer patients with severe disability who do not respond to recommended conservative treatments for multidisciplinary treatment focused on functional recovery
United Kingdom (2008) [21]	Provide information and advice to foster positive attitude and realistic expectations—back pain is not serious, temporary, tends to recur, physical not psychological, mechanical. Stay active as possible	Regular paracetamol (preferred) or NSAID as first line care. For additional analgesia combine paracetamol and NSAID or add a weak opioid (codeine or tramadol). For non-responders consider benzodiazepine, tricyclic antidepressant Not recommended: Topical NSAIDs, antiepileptic drugs (other than gabapentin), herbal remedies	Advise patient to stay as active as possible. No specific recommendations regarding exercise	No recommendations included	Acute LBP: Rest in bed is less effective than staying active	If progressive neurological deficit If pain or disability remain problematic for more than a week or two consider referral for physio/physical therapy If pain/disability continue to be a problem despite pharmacotherapy and physical therapy consider referral to multidisciplinary back pain service or chronic pain clinic

Table 2 continued

Country	Education	Medication	Exercises	Manipulation	Bed rest	Referral to specialist
United States (2007) [22]	Provide information on prognosis, staying active, self management Self-care education books recommended	Paracetamol, NSAIDs recommended as first-line drugs For acute (<4 weeks)—muscle relaxants, benzodiazepines, tramadol, opioids For subacute or chronic (>4 weeks)—antidepressants, benzodiazepines, tramadol, opioids	Not effective for acute LBP Recommended for subacute or chronic LBP	For acute LBP if not improving	Even if required for severe symptoms, patients should be encouraged to return to normal activities as soon as possible	For interdisciplinary intervention if chronic If suspicion of significant nerve root impingement or spinal stenosis
<i>Most apparent changes since 2001</i>						
	The advice to stay active remains similar. Now some guidelines (European, NZ, Canada, Italy, Norway) explicitly mention continuation/early RTW	No change regarding recommendation of paracetamol and NSAIDs as first-line treatments and recommendation regarding muscle relaxants Now more often explicit recommendations (for or against) anti-depressants, opioids, benzodiazepines and combinations of medications	The advice that exercise therapy is not useful in acute LBP has not changed Now more explicit recommendations in favour of exercise therapy in subacute and chronic LBP	Recommendations for spinal manipulation, the timing of application and target group continue to vary	The recommendation against bedrest is fairly consistent between 2001 and now	The recommendations for referral appear more explicit regarding : (1) immediate referral (cauda equina syndrome), (2) medical specialist in case of red flags, (3) referral within primary care (physiotherapy/cognitive behavioural therapy, (4) multidisciplinary treatments and (5) consider surgery if 2 years of recommended conservative care has failed

therapy that is contentious is the use of spinal manipulation. Some guidelines do not recommend the treatment (e.g. Spanish, Australian), some advise that it is optional (e.g. Austrian, Italian) and some suggest a short course for those who do not respond to the first line of treatment (e.g. US, the Netherlands). For some it is optional only in the first weeks of an episode in acute low back pain (e.g. Canada, Finland, Norway, Germany, New Zealand). The French guideline advises that there is no evidence to recommend one form of manual therapy over another.

Summary of Common Recommendations for Treatment of Low back pain

Acute or Subacute Pain

- * Reassure patients (favourable prognosis).
- * Advise to stay active.
- * Prescribe medication if necessary (preferably time-contingent): first line is paracetamol; second line is nonsteroidal antiinflammatory drugs, consider muscle relaxants, opioids or antidepressant and anticonvulsive medication (as co-medication for pain relief).
- * Discourage bed rest.
- * Do not advise a supervised exercise programme.

Chronic Pain

- * Discourage use of modalities (such as ultrasound, electrotherapy)
 - * Short-term use of medication/manipulation
 - * Supervised exercise therapy
 - * Cognitive behavioural therapy
 - * Multidisciplinary treatment
-

Setting

Table 3 shows some background variables related to the development of the guidelines in the various countries. Most of the guidelines focus on primary care though some also include secondary care. The Spanish guideline is written for health professions that treat low back pain.

Guideline committee

The various committees responsible for the development and publication of guidelines appear to be different in size and in the professional disciplines involved. Most committees are characterised by their multidisciplinary membership. These usually included primary care physicians, physical and manual therapists, orthopaedic surgeons, rheumatologists, radiologists, occupational and rehabilitation physicians. The number of members varied from 7 to 31. Only three committees included consumer representation (Australia, New Zealand, the Netherlands).

Evidence-based review

All guidelines are more or less based on a comprehensive literature search, including Cochrane Library, Medline, Embase. Some committees (Austria, Germany, Spain) based their recommendations, entirely or in part, on the European guidelines. Most guidelines use an explicit weighting of the strength of the evidence.

The Dutch, UK, European, Finnish, German, Norwegian and Australian guidelines give direct links between the actual recommendations and the evidence (via specific references) on which the recommendations are based. Other guidelines do not present a direct link but state that for recommendation there is at least moderate or fair evidence (New Zealand, US). Most committees use consensus methods, mostly by group discussions when the evidence was not convincing or not available.

Presentation and implementation

The activities related to the publication and dissemination of the various guidelines show some differences and some similarities. In most cases, the guidelines are accompanied by easily accessible summaries for practitioners and booklets for patients. Systematic implementation activities are rare. In most cases, the printed versions of the guidelines are published in national journals and/or disseminated through professional organisations to the target practitioners. Most guidelines are available on the websites of participating organisation. In many countries, regular updates of the guidelines are planned with time horizons of 3–5 years.

Discussion

In the past decade many countries have issued (updated) clinical guidelines for the management of low back pain. In general these guidelines provide similar advice on the management of low back pain. Common recommendations are the diagnostic triage of patients with low back pain, restricted use of radiographs, advice on early and progressive activation of patients, and the related discouragement of bed rest. The recognition of psychosocial factors as a risk factor for chronicity is also consistent across all guidelines, though with varying emphasis and detail. There are also differences in the recommendations provided by the guidelines, but these are few and probably less than could be expected for different health care systems and cultures. One of the reasons for the similarity of the guidelines might be that guideline committees are usually aware of the content of other guidelines and are motivated to produce similar recommendations that are deemed

Table 3 Target group, authors, evidence base, and implementation of clinical guidelines in low back pain

Country	Target group	Guideline committee	Evidence base	Consensus	Presentation/Implementation
Australia (2003)	Primary and secondary care	Multidisciplinary: Osteopathic, Rheumatology, Physiotherapy, Chiropractic, GP, Epidemiology, consumer representative ($n = 9$)	Update of the previous Australian guideline using the AGREE. Comprehensive literature search (up to 2002) pubmed, cinhal embase and Cochrane for clinical evidence. All recommendations are linked to evidence level	Use of consensus method not clear	Free online version, Included in book 'evidence-based management of acute musculoskeletal pain: a guide for clinicians'
Austria (2007)	Primary and secondary care (all who are involved with diagnosis and treatment of LBP)	Multidisciplinary (psychiatry, orthopaedics, general practice, physiotherapy, radiology, psychology, neurology, rehabilitation, osteology?, pain medicine, ergotherapy, rheumatology, neurosurgery ($n = 17$))	Based on European guidelines (2004) + updated evidence regarding massage and acupuncture. Grading of evidence was used using an explicit weighting system No direct linking between recommendations and underlying evidence	Draft guideline presented and approved at two consensus meetings	Published in national journal in Austria
Canada (2007)	Primary care	Multidisciplinary with primary health care professionals	Based on an extensive literature review of the best available evidence and assessment of knowledge in all areas of back pain management it also combines with participant's clinical experience	Use of consensus method not clear	Available on website
Europe (2006) (Acute)	Primary care	Multidisciplinary: experts in the field of low back pain research in primary care ($n = 14$)	Literature search from 1966 to 2003 on the Cochrane Library, Medline, Embase for searches of Cochrane reviews (and on other systematic reviews if a Cochrane review was not available), additional trials published after the Cochrane reviews, and existing national guidelines. Strength of evidence was assessed based on the original ratings of the AHCPR Guidelines (1994) and levels of evidence recommended in the method guidelines of the Cochrane Back Review group	Use of consensus method not clear; "use of group discussions"	Publication in a journal with planned update after 3 years
Europe (2006) (Chronic)	Primary care and secondary care	Multidisciplinary: experts in the field of low back pain research in primary care ($n = 11$)	Literature search up to 2002. Based on systematic review of systematic reviews and randomised clinical trials on CLBP. Systematic reviews were rated using the Oxman & Guyatt index and RCTs rated using the van Tulder et al. 1997 criteria	Use of consensus method not clear. Use of group discussions, no formal grading scheme used	Published on a website and in a journal. Professional associations will disseminate and implement these guidelines

Table 3 continued

Country	Target group	Guideline committee	Evidence base	Consensus	Presentation/Implementation
Finland (2008)	Primary and secondary care	Physiatrist, radiologist, general practitioner and occupational health physician, neurosurgeon, physiotherapist, orthopaedic surgeon ($n = 8$)	Based on explicit weighing of evidence. Important decision points are backed up by level of evidence statements	Consensus on evidence synthesis and text during Committee meetings	A summary of the guidelines has been published in the Finnish journal (Duodecim 2008). The whole text is published on the website of the Finnish Current Care Guidelines
France (2000)	Acute and Chronic; Non stated	Acute LBP: Multidisciplinary: Rheumatologist (2), Physiotherapist, Psychiatrist, Neuro radiologist, GP (2), Radiologist, Occupational Medicine Specialist, Orthopaedic surgeon, Specialist in Physical Medicine and Rehabilitation (11). Chronic LBP: Multidisciplinary: Rheumatologist (2), Physiotherapist, Psychiatrist, Neuro-radiologist, GP (4), Radiologist, Occupational Medicine Specialist, Orthopaedic surgeon, Specialist in Physical Medicine and Rehabilitation (13)	Acute & Chronic: Review of the literature—no further detail provided	Acute & Chronic: Use of consensus in the absence of evidence	Acute & Chronic: Guidelines commissioned from the <i>Agence Nationale d'Accreditation d'Evaluation en Sante</i> by CNAMTS, the French national health insurance fund. Reports published in English and French and available online
Germany (2007)	Primary and secondary care	Multidisciplinary: Drug committee of the German medical association, including general practice, pharmacology ($n = ?$)	Based on European guidelines (2006). Recommendations are all supported with references	Draft guidelines are presented and discussed with various medical disciplines	Complete guidelines and summaries for practitioners are available on a website
Italy (2006)	Primary and secondary care, particularly	Multidisciplinary: general medicine, neurology, neurosurgery, orthopaedics, rheumatology, physical medicine and rehabilitation, occupational medicine, physiotherapy, epidemiology ($n = 14$)	Literature search of international guidelines, systematic reviews in Medline and the Cochrane Library, weighing of evidence using a rating system based on strength of the studies	Recommendations based on level of evidence, practicality issues and own experience	Journal publication, complete version available on website, presentation at national conferences of relevant professional groups, local workshop and training days, outreach visits
New Zealand (2004)	Primary care	Multidisciplinary: consumer representative, pain medicine, occupation medicine, chiropractor, psychologist, osteopath, occupational medicine, physiotherapy, rheumatology, GP, musculoskeletal medicine ($n = 16$)	Comprehensive literature search; weighing of evidence using a rating system based on strength of the studies; for all recommendations, at least moderate evidence available	Contributed by relevant professional groups	Publication of report, incorporating the guide to assessing yellow flags, endorsed by NZ Guidelines Group and relevant professional groups
Norway (2007)	Primary and secondary care	Multidisciplinary: occupational, rehabilitation, physiotherapy, chiropractic, manual therapy, neurology, orthopaedics, radiology, general practice ($n = 11$)	Comprehensive search of the literature (Cochrane, Medline, Embase), quality assessment, weighing of evidence attached to the recommendations	Recommendations based on evidence and discussion in the group	Publication in Norwegian report, including a summary and a patient brochure

Table 3 continued

Country	Target group	Guideline committee	Evidence base	Consensus	Presentation/Implementation
Spain (2005)	Health care professionals that treat low back pain	Spanish members of the COST B13 and a multidisciplinary team composed of GP, rural medicine, rheumatology, rehabilitation, neurosurgery, orthopaedics, radiology, work medicine, public health, anxiety and stress, physical therapist, Evidence-based experts and anaesthesiologists	Adapted from the European guidelines with addition of new evidence and evidence in Spanish (systematically reviewed). Also recommendations were performed using the AGREE tool to better define the recommendation using a standardised methodology. Studies were sent to the Web de la Espalda for analysis of methodological quality	All members of the group approved the final version but consensus method is not clearly described	Summary spreadsheet with recommendations, an algorithm for diagnosis and treatment and an extensive report published online. Frequent updates are predicted
The Netherlands (2003)	Primary and secondary care	Multidisciplinary; general practice, orthopaedics, radiology, neurosurgery, rehabilitation, physiotherapy, psychology, patient representation, chiropractic, manual therapy, neurology, rheumatology, exercise therapy (Cesar, Mensendieck), anaesthesiology, occupational ($n = 31$)	All recommendations are supported as possible by scientific evidence up to Jan 2001. All evidence was weighted using an explicit weighting system. All recommendations are presented with their level of evidence	Recommendations were based on the scientific evidence + considerations such as patient preferences, costs, availability of health services, and/or organisational aspects	Published on website, distributed among hospitals and medical societies, summary published in the Dutch Medical Journal, presented in Finnish journal (Duodecim 1999)
United Kingdom (2008)	Healthcare professionals working within the NHS in England providing primary health care	Unspecified multidisciplinary team	Update of previous guidelines (PRODIGY, RCGP); incorporates new evidence from electronic database search of guidelines, systematic reviews and randomised controlled trials on primary care management of low back pain	Not reported	Part of the NHS Clinical Knowledge Summaries (CKS), a freely available, online source of evidence-based information and practical 'know how' about the common conditions managed in primary and first-contact care CKS provides quick answers to real-life clinical questions that arise in the consultation, linking to detailed answers that clearly outline the evidence on which they are based
United States (2007)	Primary care	Multidisciplinary 7 authors for a large multidisciplinary committee Clinical Efficacy Assessment Subcommittee of the ACP	Comprehensive literature search of English-language articles weighing of evidence using a rating system; for all recommendations, at least fair evidence available	Evidence-based and consensus-based	Journal publication, audio summary and patient summary Valid for 5 years after publication or until next update

Table 3 continued

Country	Target group	Guideline committee	Evidence base	Consensus	Presentation/Implementation
<i>Most apparent change, if any, since 2001</i>					
	The current guidelines appear more often focused on primary care as well as secondary care compared to 2001 when the focus was more exclusively on primary care	The guideline committees in 2001 as well as currently consist of a multidisciplinary panel (which of course is not surprisingly since multidisciplinary guidelines were included in the current and the 2001 review)	More guidelines now explicitly state that they are based on a previous guideline (i.e. the European guidelines), furthermore almost all guidelines now explicitly state that they applied a weighting system to the evidence. In 2001 a weighting system was less often used	In 2001 and at present consensus methods were used. Usually group discussion take place, but the exact method is often not clear. This has not changed since 2001	In most cases the guideline is published and disseminated without an active implementation programme. This has not changed since 2001 The main change is that currently almost all guidelines are available on a website whereas in 2001 more often paper versions were distributed

sensible and relevant. In some instances the guidelines are a national adaptation (e.g. in Spain) of the European guidelines.

We do not present an exhaustive overview of all clinical guidelines available, but focused on national multidisciplinary guidelines. This enables a reasonable comparison of recommended approaches across countries. A limitation is thus that not all available guidelines, including mono-disciplinary guidelines, are included.

Use of available evidence

Most reviews are based on extensive literature reviews. Cochrane reviews are frequently used, comprehensive searches in databases such as Medline, Embase and PEDro. Increasingly the literature reviews of other and previous guidelines are used as starting point for the (additional) searches. Most committees also use some kind of weighting system and rating of the evidence. There is some variation in the way the recommendations are presented. In some guidelines all the recommendations are directly linked with references to the supporting evidence, and in others a general remark is made that for all recommendations that there is at least moderate evidence available.

Differences in recommendations

Recommendations about the prescription of analgesic medication remain fairly consistent. Most guidelines recommend paracetamol as the first option and nonsteroidal anti-inflammatory preparations as the second option. Further recommendations about other drugs like opioids, muscle relaxants and benzodiazepines and antidepressants vary quite considerably. Part of these variations might reflect the setting and custom in different countries. Since all the guidelines were issued within a relative short time frame, the availability of underlying evidence did not vary much.

The recommendations regarding spinal manipulation continue to show some variation. In some guidelines manipulation is recommended, or presented as a therapeutic option, usually for short-term benefit, but others do not recommend it. This holds true for acute as well as chronic low back pain. The reasons for these differences remain speculative. Probably the underlying evidence is not strong enough to result in similar recommendations regarding manipulation across all guidelines, leaving the committees some more room for interpretation, but also local or political reasons may be involved.

There is now relatively large consensus across the various guidelines that specific back exercises (as opposed to the advice to stay active, including for example walking, cycling) are not recommended for patients with acute low

back pain. At the same time back exercises are recommended in chronic low back pain. Most guidelines do not recommend a particular type of exercises for chronic low back pain, but some state that they should be intense.

Recommendations in guidelines are based not only on scientific evidence but also on consensus and discussion in the guideline committees. Usually it is stated that consensus was based on group discussion, but the details of these discussions are seldom reported. It is also generally unclear which recommendations are based mainly on scientific evidence and which are based on (mainly) consensus.

There is little information on whether cost-effectiveness played an important role as a basis for the recommendation in a guideline. Of course, there are not yet many cost-effectiveness studies available [23], but it is not fully clear to what extent the published studies were used.

Most guidelines state that the prognosis of an episode of low back pain is good. This holds especially true for patients with acute episodes of low back pain. For patients presenting with a longer duration with low back pain or with recurrent low back pain the prognosis may be less favourable. More individualised and precise estimates of the prognosis of an episode of low back pain may be desirable in the future.

Few changes in management recommendations over time

This update showed that overall the recommendations in the current guidelines regarding diagnosis and treatment of low back pain did not change substantially compared to the guidelines issued about a decade ago. This may well illustrate the lack of new evidence showing better results with new diagnostic and therapeutic approaches and/or new evidence showing the inefficacy of existing interventions. A less nihilistic view could be that already a decade ago the most valid recommendations for the management of low back pain were identified. Some may argue that this is indeed the case, and that much more effort should now be given to implementation of guidelines (see below).

Some recommendations did change over time. We now see diagnostic recommendations appearing concerning the value of MRI and CT scans (i.e. in relation to exclusion and further diagnosis of red flags and serious spinal disorders). However, these recommendations are not yet strong, possibly because there are not many diagnostic studies available evaluating the value of MRI in patients with low back pain. Also, the recommendations regarding the assessment of psychosocial risk factors for chronicity are more firm in the current guidelines than that a decade ago. This reflects the insight of the importance of these risk factors for the development of chronicity and future disability. At the same time we must conclude that we are not yet very

successful in effective screening of the patients at risk and subsequent therapeutic management of them [24].

Most apparent changes regarding therapeutic interventions include the advice to continue work (despite having low back pain) and or return to work as soon as possible. There are now more recommendations of second line medications such as antidepressants, opioids, benzodiazepines and compound medications. But these recommendations are not consistent across countries, potentially because of weak underlying evidence. There are now also more firm recommendations in favour of exercise therapy in patients with subacute and chronic low back pain. The latter is partly due to the fact that currently more guidelines include recommendation for the management of chronic low back pain as compared to a decade ago. Finally, the reasons and options for referral within primary care and secondary care are now more explicitly presented. It appears that the global approach regarding the management of low back pain remained largely unchanged in the past decade, although some refinements have been suggested.

Implementation

The extent to which currently available guidelines are used and followed in the various countries remains largely unknown. A few studies evaluating various implementation strategies for low back pain guidelines show that changing clinical practice is not an easy task [25, 26]. The publication and dissemination of guidelines alone is usually not enough to change the behaviour of health care providers [27]. The development of effective implementation strategies in this area remains a challenge.

Future developments in research and guideline development

The present study was primarily aimed at presenting an update of the current clinical guidelines for the management of low back pain in primary care. Clinical guidelines focused at secondary care settings, occupational care settings, or specific subgroups of patients with lumbosacral radicular syndrome were not considered. Separate studies need to be undertaken to present an overview for these settings.

We assessed various aspects of the guideline development in Table 3. A formal assessment of the quality, e.g. with the AGREE instrument was not included. This was the topic of a separate paper which concluded that the quality of the guidelines indeed has improved over time [7].

The development of future guidelines in this field may benefit from previous experiences, evidence-based reviews, and various (inter) national guidelines as presented in this overview. The previous review of clinical guidelines listed

the following recommendations (slightly modified) for the development of future guidelines in this field. Similar to a recent review on the quality of guidelines [7], this review shows that the quality of guidelines has improved over time and some of the recommendations have been followed. This includes recommendations 1, 3, and 4 (see below). For others, there still is room for improvement Recommendation 2 is not consistently applied. Recommendations 5 and 6 have improved over time, but not all recommendations in the guidelines are directly linked to the underlying evidence, and the process of the consensus methods used is not well described. Finally, the implementation strategies and the time frame of future updates are not well presented.

Recommendations for the development of future guidelines in the field of low back pain

1. Make use of available evidence-based reviews and previous clinical guidelines.
 2. Include relevant non-English publications (if available).
 3. Determine in advance the intended target groups (health care professions, patient population, and policy makers).
 4. Be aware that the makeup of the guideline committee may have a direct impact on the content of the recommendations.
 5. Specify exactly which recommendations are evidence-based and supply the correct references to each of these recommendations.
 6. Specify exactly which recommendations are consensus-based and explain the process.
 7. Determine in advance the implementation strategy, and set a time frame for future updates of the guideline.
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