

QUALITY IMPROVEMENT IN DEGENERATIVE SPINAL SURGERY: A SYSTEMATIC
REVIEW OF QUALITY INDICATORS AND GUIDELINE RECOMMENDATIONS

Word count: 12.995

MSc in Surgical Science and Practice - 2025

Candidate Number 1078821

QUALITY IMPROVEMENT IN DEGENERATIVE SPINAL SURGERY: A SYSTEMATIC REVIEW OF QUALITY INDICATORS AND GUIDELINE RECOMMENDATIONS

MSc in Surgical Science and Practice

2025

Abstract

Degenerative spinal diseases are among the leading causes of disability worldwide, with a rising prevalence and corresponding increase in treatment demand. Despite this burden, there is a significant variability and uncertainty in surgical decision-making and outcome assessment. There is a growing and compelling need to ensure that care in degenerative spinal surgery is delivered in a patient-centred and value-based manner – and that reliable data is available to prove it. This dissertation constitutes the first systematic review of both existing quality indicators and guideline recommendations in degenerative spinal surgery.

The methodology of this systematic review was developed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline and prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO). Despite the comprehensive search strategy and inclusive eligibility criteria, no studies were identified that reported the development, evaluation or use of quality indicators in degenerative spinal surgery. Guidelines and guideline recommendations were systematically identified, catalogued and appraised using validated instruments. A total of 78 guidelines and 1,641 recommendations were extracted. The guidelines were appraised using the Appraisal of Guidelines for Research and Evaluation Global Rating Scale (AGREE GRS) instrument, while the recommendations were categorised according to Donabedian's framework and appraised using the Appraisal of Guidelines for Research and Evaluation Recommendation Excellence (AGREE REX) instrument.

The insights derived from this systematic review are intended to serve as a foundation for the translation of guideline recommendations into quality indicators. Ideally, this should be performed by a multidisciplinary expert panel to ensure methodological rigour and clinical relevance. Additionally, the findings of this review may inform spinal registries and help harmonise data collection, thereby strengthening their role as tools for monitoring practice, driving continuous improvements in care delivery and advancing patient outcomes.

Table of contents

Title page	I
Abstract	II
List of Figures	VI
List of Tables	VII
List of Abbreviations	VIII
Introduction	1
Background	1
Conceptualising and operationalising quality: from definition to measurement	3
How are we measuring quality in degenerative spinal surgery and why is it not enough	5
Quality improvement in degenerative spinal surgery: a systematic review of existing quality indicators	6
Materials and Methods	7
Protocol and registration	7
Systematic literature review	7
Classification of quality indicators and guideline recommendations according to Donabedian's model	8
Appraisal of quality indicators through the AIRE instrument	9
Appraisal of guidelines and recommendations through the AGREE GRS and REX instrument	9
Data assessment and statistical analysis	10

Results	12
Search results of systematic literature review and identification of eligible articles	12
Overview of included guidelines by region, issuing organisation and year of publication	13
Characteristics and appraisal of guidelines through the AGREE GRS instrument	26
Characteristics and classification of guideline recommendations according to Donabedian's model	28
Appraisal of guideline recommendations through the AGREE REX instrument	30
Discussion	34
The absence of quality indicators in degenerative spinal surgery: a barrier to quality improvement	34
Systemic and methodological challenges for the development of quality indicators	35
Methodological principles: developing quality indicators from guidelines	37
Guideline quality in degenerative spinal surgery: insights from the AGREE GRS appraisal	38
Guideline recommendations in degenerative spinal surgery: insights from the qualitative appraisal	39
Guideline recommendations in degenerative spinal surgery: insights from the AGREE REX appraisal	41
Future perspectives	43
Strengths and limitations	44
Conclusion	45
References	46

Appendices	64
Appendix 1 Non-exhaustive list of national institutional definitions of ‘healthcare quality’	64
Appendix 2 List of active national and international spine registries at the beginning of 2025	67
Appendix 3 Overview of terminology incorporated into the literature search strategy	71
Appendix 4 Web of Science – Search query	74
Appendix 5 Medline (Ovid) - Search query	75
Appendix 6 Scopus – Search query	76
Appendix 7 Study eligibility screening algorithm	77
Appendix 8 Appraisal of Indicators through Research and Evaluation (AIRE) instrument	78
Appendix 9 Appraisal of Guidelines for Research and Evaluation Global Rating Scale (AGREE GRS)	80
Appendix 10 Appraisal of Guidelines for Research and Evaluation Recommendation Excellence (AGREE REX)	81
Appendix 11 Overview of international, national and society-endorsed clinical practice guideline recommendations on degenerative spinal surgery	83

List of Figures

Figure 1 PRISMA 2020 flow diagram	11
Figure 2 Box plot of AGREE GRS scores across guidelines	28
Figure 3 QQ plot assessing normality of the normalised AGREE REX scores per continent	33
Figure 4 Violin plot of the normalised AGREE REX scores per continent	33

List of Tables

Table 1 Components of a robust quality indicator according to the German Institute for Quality Assurance and Transparency in Health Care (IQTIG, 2024)	11
Table 2. Overview of international, national and society-endorsed clinical practice guidelines on degenerative spinal surgery	14

List of Abbreviations

International Classification of Diseases 11 th Revision	ICD-11
World Health Organisation	WHO
Patient-reported outcome measures	PROMs
Institute of Medicine	IOM
National Institute for Health and Care Excellence	NICE
German Institute for Quality Assurance and Transparency in Health Care	IQTIG
National Quality Forum	NQF
Preferred Reporting Items for Systematic Reviews and Meta-Analyses	PRISMA
International Prospective Register of Systematic Reviews	PROSPERO
Medical Subject Headings	MeSH
Appraisal of Indicators through Research and Evaluation	AIRE
Appraisal of Guidelines for Research and Evaluation Global Rating Scale	AGREE GRS
AGREE Recommendation Excellence	AGREE REX
Interquartile ranges	IQR
Standard deviation	SD
Quantile-quantile	QQ
Analysis of variance	ANOVA
World Federation of Neurosurgical Societies	WFNS
American Association of Neurological Surgeons	AANS
Congress of Neurological Surgeons	CNS
North American Spine Society	NASS
American Physical Therapy Association	APTA
American Society of Interventional Pain Physicians	ASIPP
American College of Physicians	ACP

American College of Occupational and Environmental Medicine	ACOEM
American Society of Pain and Neuroscience	ASP
Department of Veterans Affairs & Department of Defence	VA/DoD
Belgian Health Care Knowledge Centre	KCE
Japanese Orthopaedic Association	JOA
Grading of Recommendations Assessment, Development and Evaluation	GRADE
Enhanced Recovery After Surgery	ERAS

Between the health care we have and the care we could have lies not just a gap, but a chasm –

Institute of Medicine (2001)

Introduction

Background

Spinal disorders encompass a broad spectrum of pathologies that affect the spinal column and cord. These conditions exhibit considerable heterogeneity in both aetiology and severity. According to the International Classification of Diseases 11th Revision (ICD-11) by the World Health Organisation (WHO), spinal disorders can be categorised into congenital and developmental disorders, degenerative diseases, traumatic injuries, infectious diseases, autoimmune conditions, neoplastic lesions, metabolic syndromes, vascular diseases and deformities (WHO, 2019). Among these categories, degenerative spinal diseases are the most prevalent and account for the majority of spinal pathology encountered in clinical practice (Ravindra *et al.*, 2018).

Degenerative spinal diseases are chronic conditions caused by the gradual deterioration of spinal structures. Sociodemographic changes, including an ageing population and increasingly sedentary lifestyles, have contributed to the rising prevalence and disease burden of these conditions over the past decades. Recent estimates suggest that approximately 577 million people, or approximately 10% of the global population, are currently affected by low back pain (Wu *et al.*, 2020). According to the Global Burden of Diseases study, which analysed the impact of 369 diseases and injuries across 204 countries and territories, low back pain and neck pain are respectively the leading and 4th cause of disability worldwide, together affecting over 1 billion people (Vos *et al.*, 2020; Li *et al.*, 2024). A special series on low back pain published in *The Lancet* described this issue as ‘an urgent global public health concern’, noting that ‘disability and costs attributed to low back pain are projected to increase in coming decades, particularly in low- and middle- income countries’ (Hartvigsen *et al.*, 2018).

The rising prevalence of degenerative spinal conditions has led to a corresponding increase in treatment demand, with projections indicating a continued upward trend (Torre *et al.*, 2025; Yoshihara *et al.*, 2015). A Japanese research group found that both the number of spinal surgeons and the volume of treated patients steadily increased between 2003 and 2017, with the annual incidence of lumbar spinal surgeries more than doubling during this period (Kobayashi *et al.*, 2022). Similar trends have been observed in other countries, where ageing populations and expanded access to healthcare services have contributed to a marked rise in spinal interventions (Reisener *et al.*, 2020). This has prompted ongoing debate regarding the appropriateness, indications and long-term value of these invasive procedures.

The overarching aim of treatment for degenerative spinal conditions is typically to alleviate pain, restore or maintain neurological function and improve patients' daily functioning and quality of life (Benzel, 2012). However, in contrast to traumatic or neoplastic spinal pathologies where surgical indications are typically guided by well-defined clinical criteria, the decision to pursue surgery in degenerative conditions often remains a subject of debate due to the limited availability of high-quality evidence. Even in cases where evidence to support decision-making does exist, adherence is frequently inconsistent. This suggests that surgical decisions may be influenced not only by clinical factors, such as heterogeneity in symptom presentation and variability in expert opinion, but also by non-clinical considerations including financial incentives, reimbursement models and institutional practice patterns (Sastry *et al.*, 2023). For this reason, a multifactorial assessment incorporating subjective symptom burden, clinical examination findings, radiological imaging, patient expectations and occupational demands is usually needed before a surgical strategy can be adopted. As a result, both the decision to operate and the choice of procedure can vary considerably between surgeons and institutions (Lee *et al.*, 2015).

The inherent complexity of surgical decision-making for degenerative spinal conditions introduces significant variability, not only in the surgical indications but also in the achieved outcomes and the criteria used to evaluate them (Winebrake *et al.*, 2019). In contrast to traumatic and oncological surgery, where outcome measures such as fracture stabilisation and tumour resection are relatively objective and well-defined, outcomes in degenerative spinal procedures are inherently more subjective and can differ substantially even among patients with seemingly similar diagnoses and surgical interventions. Two individuals undergoing the same decompressive surgery for lumbar stenosis, for example, may achieve comparable nerve root decompression yet report different levels of symptom relief, functional improvement or overall satisfaction. This variability underscores the fact that clinical and radiological findings alone do not fully account for postoperative outcomes in degenerative spinal surgery and that other factors such as preoperative expectations and psychosocial dimensions also play a pivotal role in shaping perceived treatment success. Therefore, quality assessment in degenerative spinal surgery cannot rely solely on traditional metrics such as length of hospital stay, infection or mortality rates, as these fail to capture the subjective and multifactorial nature of patient outcomes.

As the overarching aim of treatment for degenerative spinal conditions is typically to improve the patient's health-related quality of life, it is essential to use outcome measures that accurately reflect this dimension. The multifaceted nature of treatment decision-making and measuring outcomes has stimulated the development and use of patient-reported outcome measures (PROMs) which capture dimensions of health that are not readily quantifiable through clinical examination or imaging. The growing use of PROMs emphasizes that success of treatment is no longer defined solely by anatomical correction but by the extent to which it delivers meaningful improvements in patients' lives. Numerous PROMs have been developed and validated for use in degenerative spinal surgery. However, no clear consensus exists on which PROMs should be routinely employed and studies have demonstrated considerable variability in the accuracy of these measures for patient outcomes (Dietz *et al.*, 2018; Winebrake *et al.*, 2019). In the absence of standardised outcome measures, initiatives aimed at analysing and comparing treatment outcomes remain fragmented and inconsistent.

The growing recognition of the limitations of conventional outcome measures has sparked an ongoing debate on the need to redefine and broaden our understanding of quality in spinal care. This reflects not only a practical issue but also a more fundamental epistemological and methodological debate concerning the conceptualisation and operationalisation of quality within the context of degenerative spinal surgery: before we can meaningfully assess or improve care, it is imperative to establish a clearer understanding of what is meant by quality in general and in degenerative spinal surgery in particular. As Frymoyer (1993) already stated more than 30 years ago: 'If quality (in degenerative spinal surgery) is our goal, we need to be precise in our definition, understand how we measure it, and most importantly, be explicit in how we will improve it.'

Conceptualising and operationalising quality: from definition to measurement

According to the World Health Organisation (2006) and the Institute of Medicine (IOM, 2001), quality of care can be defined as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge'. The IOM (2001) has defined six domains which describe what high-quality care should aim to achieve: safe, effective, patient-centred, timely, efficient and equitable care. Multiple national institutions have adopted this definition, yet some ambiguity around the concept of quality persists as different institutions and people continue to attribute different meanings or accents to it. Appendix 1 presents a non-exhaustive list of national institutional definitions of healthcare quality around the globe, illustrating the considerable variation in how healthcare quality is conceptualised.

The variability around the definition of quality is to some extent unavoidable and even desirable as the concept of quality must adapt to diverse healthcare environments and priorities. This context-dependency also underscores the critical importance of explicitly defining how quality is conceptualised in a particular setting before measurement can be initiated. Without a clear and explicit definition, efforts to measure quality may lead to inconsistent, misaligned or even misleading results. A shared understanding of quality in a specific context is therefore essential to ensure that any meaningful evaluation can take place. As Donabedian (1980) argued in his pioneering manuscript on the evaluation of quality of medical care: ‘Before we can evaluate quality, we must first define it.’

Health systems have turned to the use of proxy measures in order to allow assessment of context-specific dimensions of healthcare. These proxy measures, more commonly referred to as quality indicators, attempt to translate abstract aspects of healthcare into observable and often quantifiable elements. As articulated by Arah *et al.* (2006), ‘indicators are summary measures that aim to describe as accurately as possible a relevant aspect of health or health system performance’. While they cannot fully encompass the richness of the concept, they provide a pragmatic framework through which care can be monitored, compared and improved. According to the National Institute for Health and Care Excellence (NICE, 2019), indicators should define a target population (denominator), an outcome or intervention group (nominator) and clearly specify inclusion and exclusion criteria. Complementing this structure, the German Institute for Quality Assurance and Transparency in Health Care (IQTIG, 2024) argues that a robust quality indicator should incorporate three core components: (1) a clearly defined quality goal, (2) a sound measurement concept and (3) a transparent appraisal or interpretation framework (Table 1). Together, these elements should ensure that the indicator not only captures relevant data but also provides actionable insights into the quality of delivered care.

Multiple methodological approaches for the development of quality indicators have been described (Campbell *et al.*, 2002). To ensure methodological robustness, quality indicators should be grounded in scientific evidence and developed through systematic and transparent processes. The most widely used and best documented approach is to derive them from rigorously developed clinical practice guidelines (Deckert *et al.*, 2019). When appropriately developed, such guidelines represent current standards of care, offering a credible foundation for translating recommendations into measurable benchmarks of quality. The NICE (2019) and IQTIG (2024) methodologies exemplify how quality indicators can be derived from clinical practice guidelines through a structured and transparent process. In these frameworks, guideline recommendations are systematically appraised, prioritised for indicator development by advisory committees and piloted to assess feasibility, validity and potential unintended consequences. This structured and transparent process safeguards scientific validity while ensuring relevance to clinical practice, stakeholder values and evolving health system priorities.

Table 1. Components of a robust quality indicator according to the German Institute for Quality Assurance and Transparency in Health Care (IQTIG, 2024)

Quality goal	A clear statement about the intended goal or objective (e.g. the proportion of patients developing a neurological deficit immediately after surgery should be as low as possible)
Measurement concept	A specified method for data collection and calculation of the indicator (e.g. the proportion of patients surgically treated for degenerative spinal disease who develop a neurological deficit in the first 24 hours after surgery)
Appraisal concept	A description of how a measure is expected to judge quality (e.g. when there is a new or increased post-operative neurological deficit in degenerative spinal surgery, this is considered lower quality)

Some organisations, such as the National Quality Forum (NQF, 2012) in the United States, use the term quality measure or quality metric interchangeably with quality indicator. However, in this manuscript, a distinction between the two concepts is made, in agreement with the IQTIG, to reserve the term ‘quality indicator’ for measures that are accompanied by an appraisal concept. This is because measures without an appraisal concept are unable to indicate whether measured values represent good or bad quality of care. A mortality rate for example is a quality measure, but becomes a quality indicator if a threshold is defined that indicates whether a mortality rate is considered high (indicating a poor quality of care) or low (indicating a high quality of care).

How are we measuring quality in degenerative spinal surgery and why is it not enough?

Conceptual clarity and methodological rigour are essential prerequisites for the development of meaningful quality indicators and have received increasing attention in the last decades. In response to the challenges of defining and measuring quality in spinal surgery, national and international comprehensive spinal registries have been developed over the last decades in order to standardise data collection and identify practice variation. Appendix 2 provides an overview of currently active national and international spinal registries, expanding on the scoping review conducted by Pascucci *et al.* (2023). It should be noted that this overview does not encompass the full spectrum of existing initiatives, as institutional and regional registries along with emergent or pilot programmes were not included in this summary.

These spinal registries aim to support transparency and accountability while also serving as a foundational tool for benchmarking performance. The majority of these registries collect demographic characteristics, periprocedural data and PROMs. However, a lack of alignment in how and which periprocedural data and treatment outcomes are collected persists across registries. This is partly attributable to variations in diagnostic coding, surgical technique reporting and PROM selection across registries. This inconsistency reduces comparability and limits the potential of spinal registries to drive consistent improvements in care delivery and patient outcomes. As Arjun (2017) noted in his in-depth analysis of national database research in spinal surgery, most studies using data from spinal registries focus on readmission rates, adverse events, risk factors for poor outcomes and costs. However, they often neglect functional outcomes and fail to generate actionable changes in clinical practice. A systematic review by Bennett *et al.* (2018) concluded that the application of quality indicators in spinal surgery remains underdeveloped and is therefore insufficient to support a transition to value-based care. Similarly, St. Pierre *et al.* (2018) were unable to identify quality indicators in spinal surgery, underscoring the need for robust frameworks to evaluate care quality and patient outcomes.

Quality improvement in degenerative spinal surgery: a systematic review of existing quality indicators

While registries provide extensive structural and periprocedural data, they seem to fall short in driving actionable improvements in clinical practice. Addressing this shortcoming requires a comprehensive and standardised conceptualisation of quality, supported by validated quality indicators. Without robust quality indicators that reflect both clinical effectiveness and patient experience, the ability of registries to inform practice improvement and policy development remains limited. Given the rising prevalence of degenerative spinal conditions, the corresponding increase in treatment demand and the observed complexity of surgical decision-making and outcome reporting, there is a growing and compelling need to ensure that care is delivered in a patient-centred and value-based manner – and that reliable data is available to prove it.

This manuscript constitutes the first systematic review of both existing quality indicators and guideline recommendations in degenerative spinal surgery. Beyond cataloguing and assessing currently available quality indicators, this review aims to systematically identify and appraise recommendations that could serve as a conceptual basis for indicator development. By critically assessing their methodological validity and clinical applicability, this review aims to identify methodological gaps and uncover underrepresented domains of care. The insights derived from this analysis are intended to guide the refinement of quality indicators, strengthen the methodological foundation of spinal registries and support the ongoing transition towards patient-centred, value-based healthcare.

Materials and Methods

Protocol and registration

The methodology of this systematic review was developed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA, 2020) guideline. The methodology was informed by the Cochrane Handbook for Systematic Reviews of Interventions version 6.4 (2024) and supported by expert guidance from medical librarians at the Bodleian Healthcare Libraries, University of Oxford. The protocol was registered prospectively in the International Prospective Register of Systematic Reviews (PROSPERO) under registration number CRD420251012621. This was done prior to the commencement of data extraction to ensure transparency and avoid duplication. No deviations from the registered protocol occurred during the review process. Ethics approval was not required as this review does not include individual patient data.

Systematic literature review

The literature review was conducted in accordance with the PRISMA (2020) guidelines (Figure 1). An initial conceptual framework was established based on the three core concepts central to this systematic review: degenerative spinal conditions, spinal surgery and quality indicators. For each of these core concepts, relevant search terms were identified using a combination of Medical Subject Headings (MeSH) and free-text keywords. The terminology was iteratively refined through scoping searches. Appendix 3 provides an overview of the conceptual framework. Following Cochrane and Bodleian guidance, the identified terminology was translated into a structured search query tailored to three bibliographic databases in order to ensure comprehensive coverage of the relevant literature: Web of Science, Medline (Ovid) and Scopus. The final search queries were validated by librarians at the Bodleian Healthcare Libraries to be as inclusive as possible. The corresponding search queries for the Web of Science, Medline (Ovid) and Scopus databases are provided in Appendices 4 to 6.

The Web of Science, Medline (Ovid) and Scopus databases were searched from inception to 6 June 2025 using the prespecified search queries. Grey literature was additionally explored through guideline repositories, health authority websites and professional society publications. No restrictions were applied for study design, language of publication nor year of publishing. Deduplication of the retrieved results was manually performed by the corresponding author with the assistance of Rayyan (Rayyan Systems Inc.), a web-based software tool developed to facilitate the screening process in systematic reviews. The list of retrieved publications was supplemented through forward and backward citation searching, as well as by cross-referencing with Google Scholar metadata.

A two-stage screening process was applied by the corresponding author. In the first stage, titles and abstracts were reviewed for relevance using a prospectively designed study eligibility screening algorithm. Manuscripts were excluded if they were not peer-reviewed or if the publication type was restricted to clinical, anatomical, experimental, methodological or opinion reports. Studies were also excluded if they did not involve adults with degenerative spinal disease or if they failed to address the development, evaluation or use of quality indicators or guideline recommendations. In the second stage of the screening process, full-text articles were evaluated to determine final inclusion. Only complete articles, containing information about the development, evaluation or use of at least one quality indicator or guideline recommendation specific for degenerative spinal surgery, were included. Only the most recent quality indicators or guideline recommendations from each professional society or collaborative group were included to avoid duplication and superseded recommendations. For each excluded article, the primary reason for exclusion was documented to ensure transparency of the selection process, in line with PRISMA (2020) guidance (Figure 1). The study eligibility screening algorithm is provided in Appendix 7.

Classification of quality indicators and guideline recommendations according to Donabedian's model

The retrieved quality indicators and guideline recommendations were categorised by the corresponding author according to Donabedian's (1980) seminal model on the evaluation of healthcare quality. In brief, this model distinguishes three interrelated domains through which healthcare quality can be conceptualised, operationalised and assessed: structure, process and outcome. The first domain refers to the organisational and material conditions under which care is delivered. The process domain concerns the performed diagnostic and therapeutic activities. Finally, the outcome domain covers the resulting effects of care on patients and populations. According to Donabedian, structures influence processes which in turn shape outcomes. This sequential interrelationship underscores that healthcare quality cannot be meaningfully assessed by outcomes alone, but must also consider the processes and contexts that give rise to them.

Positioning quality indicators and guideline recommendations within this triad provides not only a pragmatic classification system but also a conceptual rationale for their evaluation, allowing meaningful comparison and interpretation. Additionally, this categorisation also enables the identification of methodological gaps and the detection of underrepresented domains of care.

Appraisal of quality indicators through the AIRE instrument

The retrieved quality indicators were intended to be assessed using the Appraisal of Indicators through Research and Evaluation (AIRE) instrument, a validated tool for evaluating and quantifying the methodological quality of healthcare quality indicators. This instrument consists of twenty items grouped into four domains: (1) purpose, relevance and organisational context, (2) stakeholder involvement, (3) scientific evidence and (4) additional evidence, formulation and usage. The items were scored on the Likert scale, allowing a structured and transparent appraisal of indicator robustness. A score of 1 signifies that the criterion is not met or that relevant information is lacking, whereas a score of 4 indicates that the criterion is clearly met. A score of 2 or 3 reflects uncertainty with a tendency to respectively disagree or agree with the criterion. The score per item was summed up to obtain the total score per domain. To enable meaningful comparison across domains, domain scores were normalised. The total score on the AIRE instrument was obtained by summing all normalised domain scores. An overview of the AIRE instrument's items and domains is provided in Appendix 8 (De Koning *et al.*, 2007).

Appraisal of guidelines and recommendations through the AGREE GRS and REX instruments

The retrieved guidelines were evaluated using the Appraisal of Guidelines for Research and Evaluation Global Rating Scale (AGREE GRS) instrument. This validated tool, derived from the more comprehensive AGREE II instrument, provides a concise and pragmatic approach to evaluating and quantifying the quality of clinical practice guidelines. Reliability testing has shown that the AGREE GRS produces results comparable to AGREE II, despite lower sensitivity in detecting differences in guideline quality. The AGREE GRS was selected as the most appropriate tool for this review, as it demonstrates validity and reliability comparable to AGREE II while requiring substantially fewer time and resources. The AGREE GRS instrument consists of four core items: (1) process of development, (2) presentation style, (3) completeness of reporting and (4) clinical validity. The items were scored on the Likert scale according to the completeness and quality of reporting, allowing a systematic and transparent appraisal of the methodological robustness of the guideline. A score of 1 signifies that the criterion is not met or that relevant information is lacking, whereas a score of 7 indicates that the quality of reporting is exceptional and the criterion is clearly met. A score between 2 and 6 was assigned when the reporting of the AGREE GRS item does not meet all of the included considerations. Once the four core items were assessed, an overall assessment was additionally conducted to provide a global appraisal of each guideline. This included scoring three items on the Likert scale: (1) an evaluation of the guideline's overall quality, (2) a recommendation regarding its potential use in clinical practice and (3) an appraisal of its applicability within the context of degenerative spinal surgery. An overview of the AGREE GRS instrument's items is provided in Appendix 9 (Brouwers *et al.*, 2010).

The individual guideline recommendations were assessed with the AGREE Recommendation Excellence (AGREE REX) instrument, a valid and reliable tool developed as a complement to the AGREE II and AGREE GRS tool for evaluating the quality of guideline recommendations. Use of the REX instrument provides an additional layer of appraisal, ensuring that recommendations are not only evidence-based but also implementable in routine clinical practice. The AGREE REX instrument consists of nine items grouped into three domains: (1) clinical credibility and applicability, (2) incorporation of stakeholder values and (3) implementability of the recommendations. Similar as in the AGREE GRS instrument, the items were scored on the Likert scale with a score of 1 signifying that the criterion is not met or that relevant information is lacking, whereas a score of 7 indicates that the criterion is clearly met. The item scores were summed to obtain the total score. To enable comparison between recommendations, the total score was normalised. The calculation of the normalised score applied equal weighting to each of the nine items, despite the lack of evidence regarding their relative importance in determining recommendation quality. As a result, these scores do not yield detailed insights into the specific strengths and weaknesses of the guideline recommendations on their own. Nonetheless, reporting an overall score offers a pragmatic means of summarising and comparing the quality of guideline recommendations across multiple sources. An overview of the AGREE REX instrument's items is provided in Appendix 10 (Brouwers *et al.*, 2020).

Data assessment and statistical analysis

The retrieved results were collected and appraised by the corresponding author prior to statistical analysis. The characteristics of the guidelines and their recommendations were first appraised qualitatively, after which the AIRE, AGREE GRS and AGREE REX instruments were rated. The AIRE and AGREE GRS scores, both rated on Likert scales, were treated as ordinal variables and presented using medians with interquartile ranges (IQR). Accordingly, these results were graphically visualised in boxplots. The AGREE REX scores were normalised, allowing them to be treated as continuous variables and presented as means with standard deviations (SD). In the absence of repeated ratings, inter-rater reliability could not be assessed. Instead, within-guideline variability was reported descriptively using the IQR for AGREE GRS scores and the SD for AGREE REX scores.

Direct pairwise comparisons of AGREE REX scores across all individual guidelines were not performed, as this would yield numerous results of limited interpretability and overlook structural differences in scope, methodology and content. Instead, differences in AGREE REX scores were assessed at the continental level to provide more meaningful aggregate comparisons. This approach follows the methodology of Florez *et al.* (2020), which advocates examining broader geographic patterns rather than conducting exhaustive pairwise testing.

To determine the appropriate statistical test, normality was first examined using the Shapiro–Wilk and Kolmogorov–Smirnov tests combined with visual inspection of quantile-quantile (QQ) plots. Homogeneity of variances was examined using Levene’s test. An analysis of variance (ANOVA) test, followed by a post-hoc Bonferroni test, was considered if variances were equal and a Welch’s ANOVA test, followed by a Games-Howell test, if variances were unequal. All statistical analyses were performed using IBM SPSS Statistics for Windows, version 29 (IBM Corp, New York, United States of America). All graphs were generated using the GraphPad Prism software (GraphPad Software, California, United States of America).

Figure 1. PRISMA 2020 flow diagram

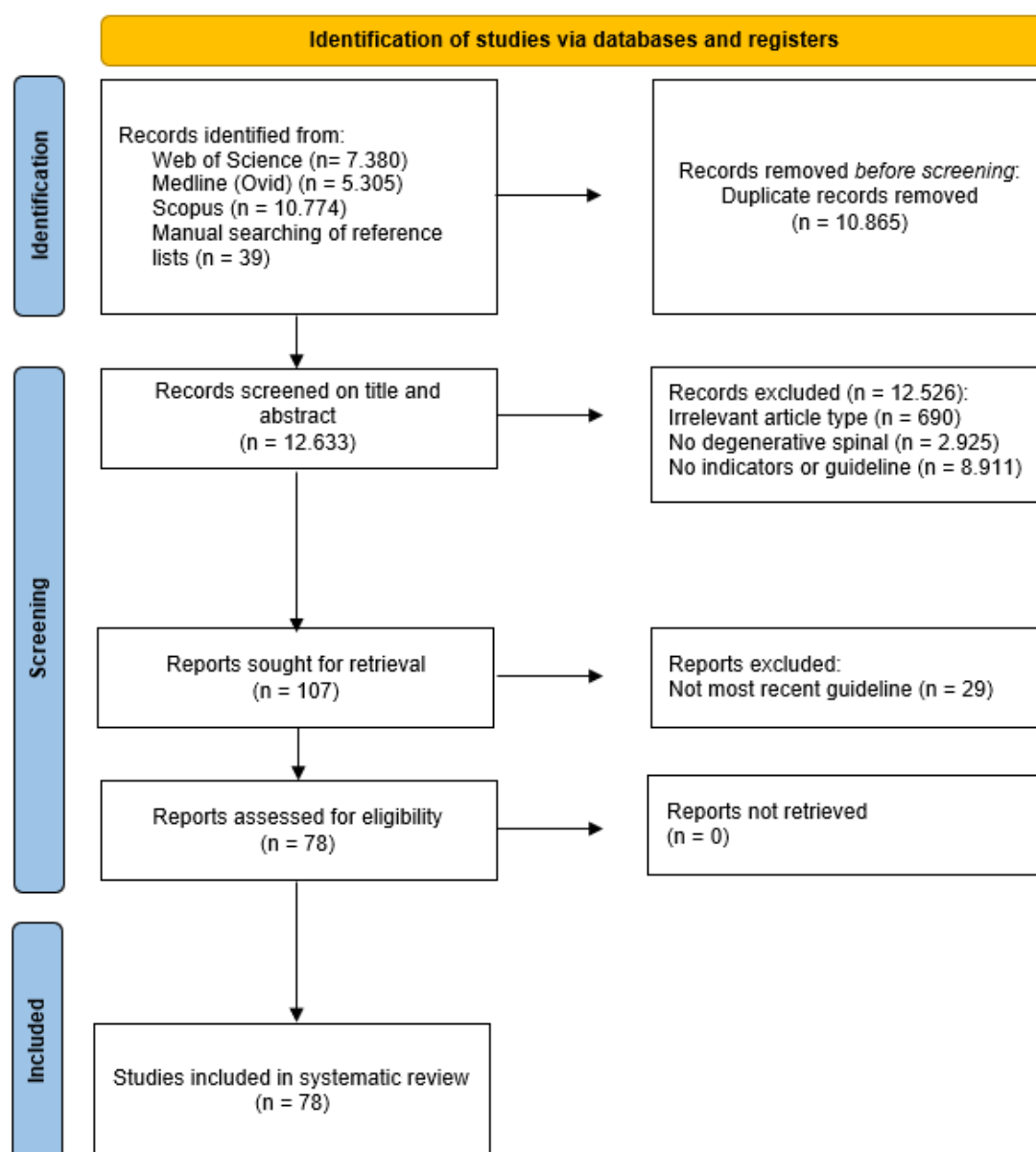


Figure 1. The literature review was conducted in accordance with the PRISMA (2020) guidelines. This diagram illustrates the flow of information through the different phases of the systematic review. The final number of included publications is shown at the bottom of the diagram.

Results

Search results of systematic literature review and identification of eligible articles

The Web of Science, Medline (Ovid) and Scopus databases were searched from inception to 6 June 2025 using the prespecified search queries, as provided in Appendices 4 to 6. No restrictions were applied for study design, language of publication nor year of publishing. The database searches respectively yielded 7,380, 5,305 and 10,774 publications. A total of 10,865 duplicate records were removed during deduplication. The search results were supplemented through forward and backward citation searching and cross-referencing with Google Scholar metadata, resulting in a total of 12,632 unique records. Titles and abstracts were screened for relevance, using the prospectively developed study eligibility algorithm provided in Appendix 7. At this stage, 12,526 records were excluded. Specifically, 690 articles were excluded because they were not peer-reviewed or were classified as clinical, anatomical, experimental, methodological or opinion reports. An additional 2,925 records were excluded as they did not pertain to adult populations with degenerative spinal disease. Finally, 8,911 articles were excluded because they did not concern the development, evaluation or application of quality indicators or guideline recommendations. The eligibility of the remaining 106 full-text records was further assessed. Studies were included if they reported the development, evaluation or use of at least one quality indicator or guideline recommendation for degenerative spinal surgery. Only the most recent quality indicators or guideline recommendations from each professional society or collaborative consortium were included to avoid duplication and superseded recommendations (Figure 1). Ultimately, 78 articles fulfilled the eligibility criteria and were retained for qualitative and statistical synthesis.

All included articles consisted of international, national or society-endorsed clinical practice guidelines. No publications were identified that described the development, evaluation or use of quality indicators for degenerative spinal surgery. Several guideline recommendations, such as 'Changes in pain in patients with degenerative spinal disorders should be assessed with VAS scores' (German Spine Society, 2025) contained elements consistent with NICE (2019) criteria for quality indicator development, including an implied target population (denominator) and a defined outcome group (numerator). However, these components were inconsistently specified, and explicit inclusion and exclusion criteria were absent throughout. Similarly, the requirements for IQTIG (2024) quality indicators were unmet, as recommendations consistently lacked both a defined measurement concept and a clear appraisal or interpretation framework. As a result, the AIRE score could not be calculated. The appraisal of the guidelines and their recommendations was therefore restricted to Donabedian's categorisation alongside the application of the AGREE GRS and AGREE REX instruments.

Overview of included guidelines by region, issuing organisation and year of publication

An overview of all 78 retrieved guidelines, including full publication details and year of issue, is provided in Table 2. A more comprehensive overview of all included guidelines, together with the categorisation and appraisal of their recommendations, is provided in Appendix 11. A total of 9 guidelines were published by international federations, including 7 by the World Federation of Neurosurgical Societies (WFNS, 2019a, 2019b, 2020a-c, 2024a, 2024b), 1 by the Enhanced Recovery After Surgery Society (2021) and 1 by the WHO (2023).

A further 39 guidelines originated from North American societies. Of these, 16 were published by a consortium of the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (2014a-p). These represent separate sections of one guideline. However, as they were published separately, they are treated as distinct guidelines in this manuscript. Additional guidelines were issued by the North American Spine Society (NASS, 2009, 2011, 2013a, 2013b, 2014), the American Pain Society (2009), the American Physical Therapy Association (APTA, 2012), the American Society of Interventional Pain Physicians (ASIPP, 2013, 2020, 2021), the American College of Physicians (ACP, 2017), AO Spine North America (2017), the Lumbar Spinal Stenosis Consensus Group (2018), the Department of Veterans Affairs (2019), the American College of Occupational and Environmental Medicine (ACOEM, 2020a, 2020b, 2021), the American College of Radiology (2021), the Congress of Neurological Surgeons (CNS, 2021a, 2021b), the Canadian Chiropractic Research Foundation (2021) and the American Society of Pain and Neuroscience (ASP, 2022, 2023).

Guidelines issued by European organisations accounted for 22 of the total, including four from the German Spine Society (2018, 2020, 2024, 2025), two from the Working Group on Guidelines for Chronic Low Back Pain (2006a, 2006b), two from the Danish Health Authority (2017, 2019) and two from the Polish Society of Spinal Surgery (2016a, 2016b). Additional contributions came from The Norwegian Communication Unit for Musculoskeletal Disorders (2006), the Italian Society of Spinal Surgery (2008), the Belgian Health Care Knowledge Centre (2017), the European Society of Anaesthesiology (2018), the Dutch Orthopaedic Association (2020), NICE (2020), the Dutch Organisation for Occupational Physicians (2021), the French Society of Physical Medicine and Rehabilitation (2021), a consortium located in the Czech Republic (2023), the Royal Dutch Society for Physical Therapy (2024) and AO Spine (2024).

Finally, eight guidelines were retrieved from South America and Asia. These were published by the Brazilian Association of Physical Medicine and Rehabilitation (2013), the Spinal Surgery Group of the Chinese Orthopaedic Association (2015), the Ecuadorian Ministry of Public Health (2016), the Peruvian Ministry of Public Health (2016), the Japanese Orthopaedic Association (2021), the Korean Acupuncture and Moxibustion Medicine Society (2022), the Chinese Association of Integrative Medicine (2024) and the Korean Pain Society (2024).

Table 2. Overview of international, national and society-endorsed clinical practice guidelines on degenerative spinal surgery¹

International

2019	World Federation of Neurosurgical Societies Spine Committee	Cervical spondylotic myelopathy: natural course and the value of diagnostic techniques
	<i># of recommendations: 17</i>	<i>AGREE GRS²</i>
	<i>AGREE REX³</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 66.2% (±9.2%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2019	World Federation of Neurosurgical Societies Spine Committee	Anterior surgical techniques for cervical spondylotic myelopathy
	<i># of recommendations: 10</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 63.7% (±8.7%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2020	World Federation of Neurosurgical Societies Spine Committee	Natural course and diagnosis of lumbar spinal stenosis
	<i># of recommendations: 6</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 73.7% (±8.0%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2020	World Federation of Neurosurgical Societies Spine Committee	Fusion surgery for lumbar spinal stenosis: WFNS spine committee recommendations
	<i># of recommendations: 7</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 68.4% (±4.7%)</i>	<i>I would recommend this guideline for use in practice: 4</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2020	World Federation of Neurosurgical Societies Spine Committee	Mobility-preserving surgery for lumbar spinal stenosis
	<i># of recommendations: 4</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 62.0% (±8.9%)</i>	<i>I would recommend this guideline for use in practice: 3</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 3</i>

2021	Enhanced Recovery After Surgery Society	Consensus statement for perioperative care in lumbar spinal fusion	<i># of recommendations: 28</i> <i>AGREE REX</i> <i>Mean (± SD): 70.8% (±7.5%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>	<i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 6</i>
2023	World Health Organization	WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings	<i># of recommendations: 37</i> <i>AGREE REX</i> <i>Mean (± SD): 65.9% (±9.0%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>	<i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 6</i>
2024	World Federation of Neurosurgical Societies Spine Committee	Lumbar disc herniation: Prevention and treatment of recurrence	<i># of recommendations: 7</i> <i>AGREE REX</i> <i>Mean (± SD): 66.6% (±8.3%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 4</i>	<i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 4</i>
2024	World Federation of Neurosurgical Societies Spine Committee	Role of surgery in primary lumbar disk herniation	<i># of recommendations: 5</i> <i>AGREE REX</i> <i>Mean (± SD): 78.6% (±8.0%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>	<i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 6</i>

North America

2009	North American Spine Society	An evidence-based clinical guideline for the use of antithrombotic therapies in spine surgery	<i># of recommendations: 9</i> <i>AGREE REX</i> <i>Mean (± SD): 65.6% (±4.4%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>	<i>Rate the overall quality of this guideline: 3</i> <i>I would recommend this guideline for use in practice: 5</i>
2009	American Pain Society	Interventional therapies, surgery and interdisciplinary rehabilitation for low back pain	<i># of recommendations: 15</i> <i>AGREE REX</i> <i>Mean (± SD): 73.3% (±11.0)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>	<i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 6</i>
2011	North American Spine Society	An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders	<i># of recommendations: 24</i> <i>AGREE REX</i> <i>Mean (± SD): 71.3% (±9.6%)</i>	<i>AGREE GRS</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>	<i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 6</i>

2012	American Physical Therapy Association	Low back pain - Clinical practice guidelines linked to the international classification of functioning, disability and health
	<i># of recommendations: 14</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 69.6% (±11.7%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2013	North American Spine Society	An evidence-based clinical guideline for the diagnosis and treatment of degenerative lumbar spinal stenosis
	<i># of recommendations: 31</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 64.6% (±11.0%)</i>	<i>I would recommend this guideline for use in practice: 6</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2013	North American Spine Society	An evidence-based clinical guideline for antibiotic prophylaxis in spine surgery
	<i># of recommendations: 22</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 66.0% (±7.2%)</i>	<i>I would recommend this guideline for use in practice: 6</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2013	American Society of Interventional Pain Physicians	An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain
	<i># of recommendations: 28</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 62.4% (±8.8%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	North American Spine Society	Evidence-based clinical guidelines for multidisciplinary spine care: diagnosis and treatment of degenerative lumbar spondylolisthesis
	<i># of recommendations: 34</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 64.4% (±11.7%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: Assessment of functional outcome following lumbar fusion
	<i># of recommendations: 3</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 89.0% (±5.3%)</i>	<i>I would recommend this guideline for use in practice: 6</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 3: Assessment of economic outcome
	<i># of recommendations: 6</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 63.2% (±10.4%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 4: Radiographic assessment of fusion status
	<i># of recommendations: 6</i> <i>AGREE REX</i> <i>Mean (± SD): 75.3% (±3.3%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guidelines for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: correlation between radiographic and functional outcome.
	<i># of recommendations: 1</i> <i>AGREE REX</i> <i>Mean (± SD): 76.0% (±NA⁴)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 6: Discography for patient selection
	<i># of recommendations: 3</i> <i>AGREE REX</i> <i>Mean (± SD): 69.3% (±16.1%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 4</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 7: lumbar fusion for intractable low-back pain without stenosis or spondylolisthesis
	<i># of recommendations: 2</i> <i>AGREE REX</i> <i>Mean (± SD): 66.5% (±2.1%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 8: Lumbar fusion for disc herniation and radiculopathy
	<i># of recommendations: 3</i> <i>AGREE REX</i> <i>Mean (± SD): 69.0% (±10.5%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 9: Lumbar fusion for stenosis with spondylolisthesis
	<i># of recommendations: 2</i> <i>AGREE REX</i> <i>Mean (± SD): 68.0% (±0%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 10: lumbar fusion for stenosis without spondylolisthesis
	<i># of recommendations: 2</i> <i>AGREE REX</i> <i>Mean (± SD): 83.5% (±7.8%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 11: Interbody techniques for lumbar fusion
	<i># of recommendations: 4</i> <i>AGREE REX</i> <i>Mean (± SD): 70.5% (±7.0%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 12: Pedicle screw fixation as an adjunct to posterolateral fusion
	<i># of recommendations: 2</i> <i>AGREE REX</i> <i>Mean (± SD): 81.5% (±13.4%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 13: Injection therapies, low-back pain, and lumbar fusion
	<i># of recommendations: 9</i> <i>AGREE REX</i> <i>Mean (± SD): 69.1% (±11.5%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 14: Brace therapy as an adjunct to or substitute for lumbar fusion
	<i># of recommendations: 5</i> <i>AGREE REX</i> <i>Mean (± SD): 71.2% (±10.9%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 4</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 15: Electrophysiological monitoring and lumbar fusion
	<i># of recommendations: 2</i> <i>AGREE REX</i> <i>Mean (± SD): 58.5% (±4.9%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 3</i> <i>I would make use of a guideline of this quality in my professional decisions: 4</i>

2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 16: Bone graft extenders and substitutes as an adjunct for lumbar fusion
	<i># of recommendations: 17</i> <i>AGREE REX</i> <i>Mean (± SD): 70.5% (±11.2%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2014	American Association of Neurological Surgeons & Congress of Neurological Surgeons	Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 17: Bone growth stimulators as an adjunct for lumbar fusion
	<i># of recommendations: 3</i> <i>AGREE REX</i> <i>Mean (± SD): 52.7% (±7.8%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 4</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2017	American College of Physicians	Non-invasive treatments for acute, subacute and chronic low back pain
	<i># of recommendations: 3</i> <i>AGREE REX</i> <i>Mean (± SD): 69.3% (±2.3%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2017	AO Spine North America & Cervical Spine Research Society	A clinical practice guideline for the management of patients with degenerative cervical myelopathy: recommendations for patients with mild, moderate, and severe disease and nonmyelopathic patients with evidence of cord compression
	<i># of recommendations: 5</i> <i>AGREE REX</i> <i>Mean (± SD): 66.2% (±8.3%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2018	Lumbar Spinal Stenosis Consensus Group	The MIST guidelines: The lumbar spinal stenosis consensus group guidelines for Minimally Invasive Spine Treatment
	<i># of recommendations: 11</i> <i>AGREE REX</i> <i>Mean (± SD): 73.5% (±10.1%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2019	Department of Veterans Affairs & Department of Defence	VA/DoD clinical practice guideline: Diagnosis and treatment of low back pain
	<i># of recommendations: 38</i> <i>AGREE REX</i> <i>Mean (± SD): 67.1% (±7.9%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2020	American College of Occupational and Environmental Medicine	ACOEM guidelines: Diagnostic tests for low back disorders
	<i># of recommendations: 28</i> <i>AGREE REX</i> <i>Mean (± SD): 73.2% (±9.0%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2020	American College of Occupational and Environmental Medicine	ACOEM guidelines: Non-invasive and minimally invasive management of low back disorders
	<i># of recommendations: 90</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 69.3% (±7.1%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2020	American Society of Interventional Pain Physicians	Comprehensive evidence-based guidelines for facet joint interventions in the management of chronic spinal pain
	<i># of recommendations: 20</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 65.9% (±6.4%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2021	American College of Occupational and Environmental Medicine	ACOEM guidelines: Invasive treatments for low back disorders
	<i># of recommendations: 45</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 73.9% (±10.8%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2021	American College of Radiology	American College of Radiology appropriateness criteria. Myelopathy: 2021 update
	<i># of recommendations: 6</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 73.7% (±8.8%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2021	American Society of Interventional Pain Physicians	Epidural interventions in the management of chronic spinal pain
	<i># of recommendations: 8</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 64.5% (±11.9%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2021	Congress of Neurological Surgeons	Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative opioid evaluation
	<i># of recommendations: 3</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 74.0% (±10.6%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2021	Congress of Neurological Surgeons	Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative osteoporosis assessment
	<i># of recommendations: 3</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 6</i>
	<i>Mean (± SD): 71.7% (±9.1%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2021	Canadian Chiropractic Research Foundation	Non-surgical interventions for lumbar spinal stenosis leading to neurogenic claudication: a clinical practice guideline
	<i># of recommendations: 13</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 67.3% (±9.6%)</i>	<i>I would recommend this guideline for use in practice: 4</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2022	American Society of Pain and Neuroscience	The American Society of Pain and Neuroscience evidence-based clinical guideline of interventional treatments for low back pain
	<i># of recommendations: 60</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 67.7% (±7.4%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2023	American Society of Pain and Neuroscience	Informed consent for spine procedures: best practice guideline from the American Society of Pain and Neuroscience
	<i># of recommendations: 10</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 82.6% (±6.7%)</i>	<i>I would recommend this guideline for use in practice: 7</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 6</i>

South America

2013	Brazilian Association of Physical Medicine and Rehabilitation	Chronic nonspecific low back pain: Rehabilitation
	<i># of recommendations: 38</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 63.1% (±6.4%)</i>	<i>I would recommend this guideline for use in practice: 4</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2016	Ecuadorian Ministry of Public Health	Low back pain – Clinical practice guideline
	<i># of recommendations: 189</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 5</i>
	<i>Mean (± SD): 66.9% (±8.1%)</i>	<i>I would recommend this guideline for use in practice: 5</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2016	Peruvian Ministry of Public Health	Clinical practice guideline for the diagnosis and treatment of low back pain
	<i># of recommendations: 11</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 66.5% (±6.0%)</i>	<i>I would recommend this guideline for use in practice: 4</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 4</i>

Europe

2006	Working Group on Guidelines for Chronic Low Back Pain	European guidelines for the management of chronic nonspecific low back pain
	<i># of recommendations: 47</i>	<i>AGREE GRS</i>
	<i>AGREE REX</i>	<i>Rate the overall quality of this guideline: 4</i>
	<i>Mean (± SD): 75.0% (±8.9%)</i>	<i>I would recommend this guideline for use in practice: 6</i>
		<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2006	Working Group on Guidelines for Chronic Low Back Pain	European guidelines for the management of acute nonspecific low back pain in primary care
	<i># of recommendations: 13</i> <i>AGREE REX</i> <i>Mean (± SD): 70.6% (±8.2%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2006	The Norwegian Communication Unit for Musculoskeletal Disorders	National clinical guidelines: Low back pain – with and without nerve root involvement
	<i># of recommendations: 90</i> <i>AGREE REX</i> <i>Mean (± SD): 67.2% (±8.4%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2008	Italian Society of Spinal Surgery	Appropriateness of diagnosis and surgical treatment of symptomatic lumbar disc herniation
	<i># of recommendations: 49</i> <i>AGREE REX</i> <i>Mean (± SD): 69.8% (±6.7%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2016	The Polish Society of Spinal Surgery	Treatment of degenerative cervical spondylosis with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery
	<i># of recommendations: 12</i> <i>AGREE REX</i> <i>Mean (± SD): 67.4% (±6.6%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2016	The Polish Society of Spinal Surgery	Treatment of lumbar disc herniation with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery
	<i># of recommendations: 17</i> <i>AGREE REX</i> <i>Mean (± SD): 67.7% (±11.7%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2017	Danish Health Authority	National clinical guidelines for non-surgical treatment of patients with recent onset neck pain or cervical radiculopathy
	<i># of recommendations: 10</i> <i>AGREE REX</i> <i>Mean (± SD): 65.7% (±3.4%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2017	Belgian Health Care Knowledge Centre	KCE Report 287 Good clinical practice: Low back pain and radicular pain: assessment and management
	<i># of recommendations: 41</i> <i>AGREE REX</i> <i>Mean (± SD): 68.7% (±6.2%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i> <i>I would recommend this guideline for use in practice: 6</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2018	German Spine Society	German S2k guideline, Lumbar radiculopathy guidelines for diagnostics and therapy in neurology
	<i># of recommendations: 9</i> <i>AGREE REX</i> <i>Mean (± SD): 68.7% (±3.2%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2018	European Society of Anaesthesiology	European guidelines on perioperative venous thromboembolism prophylaxis: neurosurgery
	<i># of recommendations: 5</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 4</i>
	<i>Mean (± SD): 59.8% (±4.7%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2019	Danish Health Authority	Danish national clinical guidelines for surgical and nonsurgical treatment of patients with lumbar spinal stenosis
	<i># of recommendations: 10</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 4</i>
	<i>Mean (± SD): 64.3% (±7.5%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2020	Dutch Orthopaedic Association	Guideline: Instrumented spine surgery
	<i># of recommendations: 33</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 6</i>
	<i>Mean (± SD): 70.7% (±7.0%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2020	National Institute for Health and Care Excellence	Low back pain and sciatica in over 16s: assessment and management – NICE guideline
	<i># of recommendations: 47</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 6</i>
	<i>Mean (± SD): 70.2% (±5.5%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2020	German Spine Society	German spine society S2K guideline on conservative, surgical, and rehabilitative management of disc herniation with radicular symptoms
	<i># of recommendations: 90</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 68.0% (±7.4%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2021	Dutch Organisation for Occupational Physicians, Dutch Organisation for Physicians in Social Insurance Medicine & Dutch Organisation for Medical Officers in Private Insurances	The Dutch multidisciplinary occupational health guideline to enhance work participation among low back pain and lumbosacral radicular syndrome patients
	<i># of recommendations: 18</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 67.8% (±4.7%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2021	French Society of Physical Medicine and Rehabilitation	Rehabilitation and lumbar surgery: the French recommendations for clinical practice
	<i># of recommendations: 20</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 70.4% (±6.7%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2023	Czech Republic	Surgical treatment of degenerative lumbar stenosis and spondylolisthesis: Clinical practice guideline
	<i># of recommendations: 4</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 72.5% (±9.1%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2024	Royal Dutch Society for Physical Therapy	Management of low back pain and lumbosacral radicular syndrome: the guideline of the Royal Dutch Society for Physical Therapy
	<i># of recommendations: 11</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 69.5% (±3.2%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2024	AO Spine	AO Spine guideline for the use of osteobiologics (AOGO) in anterior cervical discectomy and fusion for spinal degenerative cases
	<i># of recommendations: 5</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 6</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 6</i>
	<i>Mean (± SD): 72.6% (±5.1%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 6</i>
2024	German Spine Society	German Spine Society S2k guideline, specific low back pain
	<i># of recommendations: 32</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 70.8% (±3.8%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>
2025	German Spine Society	German Spine Society S3 guideline, epidural injections in degenerative spinal disorders
	<i># of recommendations: 43</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 69.2% (±4.1%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

Asia and Oceania

2015	Spinal Surgery Group of the Chinese Orthopaedic Association	Clinical guideline for treatment of symptomatic thoracic spinal stenosis
	<i># of recommendations: 27</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 3</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 5</i>
	<i>Mean (± SD): 71.1% (±5.8%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 4</i>
2021	Japanese Orthopaedic Association	Japanese Orthopaedic Association (JOA) clinical practice guidelines on the management of lumbar spinal stenosis, 2021 - Secondary publication
	<i># of recommendations: 29</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 5</i>
	<i>AGREE REX</i>	<i>I would recommend this guideline for use in practice: 6</i>
	<i>Mean (± SD): 69.0% (±12.7%)</i>	<i>I would make use of a guideline of this quality in my professional decisions: 5</i>

2022	Korean Acupuncture and Moxibustion Medicine Society, Society of Korean Medicine Rehabilitation, Association of the Spine and Joint Korean Medicine	Korean medicine clinical practice guidelines for lumbar herniated intervertebral disc in adults: based on grading of recommendations assessment, development and evaluation
	<i># of recommendations: 14</i> <i>AGREE REX</i> <i>Mean (± SD): 57.0% (±6.4%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 2</i> <i>I would make use of a guideline of this quality in my professional decisions: 2</i>
2024	Chinese Association of Integrative Medicine, Chinese Society of Traditional Chinese Medicine, Chinese Medical Association	Guidelines for the diagnosis and treatment of lumbar spinal stenosis with integrated traditional Chinese medicine and Western medicine
	<i># of recommendations: 12</i> <i>AGREE REX</i> <i>Mean (± SD): 50.5% (±8.5%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 3</i> <i>I would recommend this guideline for use in practice: 2</i> <i>I would make use of a guideline of this quality in my professional decisions: 2</i>
2025	Korean Pain Society, Korean Spinal Pain Society, Korean Spinal Neurosurgery Society	Evidence-based clinical practice guidelines for patients with lumbar disc herniation with radiculopathy in South Korea
	<i># of recommendations: 5</i> <i>AGREE REX</i> <i>Mean (± SD): 71.2% (±1.8%)</i>	<i>AGREE GRS</i> <i>Rate the overall quality of this guideline: 4</i> <i>I would recommend this guideline for use in practice: 5</i> <i>I would make use of a guideline of this quality in my professional decisions: 5</i>

¹ International, national and society-endorsed guidelines on degenerative spinal surgery, along with their recommendations, were included. Non-guideline consensus statements, position papers, policy statements, surveys and systematic reviews were excluded. When multiple versions of the same guideline existed, only the most recent version was considered. ² The guidelines were assessed using the AGREE GRS instrument (Appendix 9). This validated tool, derived from the more comprehensive AGREE II instrument, provides a concise and pragmatic approach to evaluating and quantifying the quality of clinical practice guidelines. The items were scored on the Likert scale, where a score of 1 signifies that the item is not met or that relevant information is lacking, whereas a score of 7 indicates that the item is clearly met. ³ The guideline recommendations were appraised using the AGREE REX instrument (Appendix 10). This tool complements the AGREE GRS instrument by specifically evaluating the quality and implementability of guideline recommendations. All scores were normalised to enable comparison between recommendations. ⁴ Not applicable.

Characteristics and appraisal of guidelines through the AGREE GRS instrument

The retrieved publications comprised 10 general spinal or periprocedural, 8 cervical, 1 thoracic and 59 lumbar-focused guidelines. Half of the general spinal guidelines concerned general interventional techniques (n = 3) and perioperative venous thromboembolism prophylaxis (n = 2). The remaining general spinal guidelines addressed antibiotic prophylaxis (n = 1), perioperative opioid use (n = 1), perioperative osteoporosis assessment (n = 1), informed consent for spinal procedures (n = 1) and instrumented spinal surgery in general (n = 1). Among the anatomical region-specific publications, the main focus was distributed across surgical indications and techniques (n = 30), combined diagnostic and therapeutic aspects (n = 20), conservative treatment options (n = 11), diagnostic strategies (n = 5) and interventional techniques (n = 2).

The guidelines were appraised using the AGREE GRS instrument. As outlined in the Materials and Methods section, this instrument is composed of four core items: (1) process of development, (2) presentation style, (3) completeness of reporting and (4) clinical validity. Following the assessment of the four core items, an overall assessment was conducted to provide a global appraisal per guideline. The overall appraisal, reported in this manuscript, included scoring three items on a Likert scale (1-7): (1) the guideline's overall quality, (2) its potential use in clinical practice and (3) its applicability within the context of degenerative spinal surgery. The full instrument is provided in Appendix 9.

The median overall quality score across all guidelines was 5 (IQR 4-6), with values ranging from 3 to 6 (Figure 2). The lowest score was assigned to the guideline by the Spinal Surgery Group of the Chinese Orthopaedic Association (2015) on the treatment of symptomatic thoracic spinal stenosis and the guideline by the Chinese Association of Integrative Medicine (2024) on the diagnosis and treatment of lumbar spinal stenosis using integrated traditional Chinese medicine and Western medicine. The highest score was given to multiple, predominantly North American, guidelines, including those issued by NASS (2011, 2013a, 2014), ASIPP (2013, 2020, 2021), AANS & CNS (2014a-p), ACP (2017), AO Spine North America (2017), ACOEM (2020a, 2020b, 2021), CNS (2021a, 2021b), NICE (2020) and AO Spine (2024). Lower scores were generally attributable to methodological shortcomings such as limited transparency in guideline development methodology, insufficient completeness of reporting and restricted clinical validity. Conversely, higher scores were assigned to guidelines that demonstrated methodological rigour. The highest-scoring guidelines incorporated comprehensive systematic literature searches, qualitative evidence synthesis, formal engagement of a multidisciplinary panel, conflict of interest management, use of structured consensus methods, explicit grading of evidence and recommendations, clear formulation of recommendations and comprehensive reporting of clinically oriented recommendations.

The two remaining items of the AGREE GRS instrument, namely the extent to which each guideline is recommended for potential use in clinical practice and its perceived applicability within the specific context of degenerative spinal surgery, are inherently more subjective in character. For this reason, their rater scores are reported primarily for the sake of completeness rather than for comparative interpretation. The median score for the degree of recommendation concerning potential use in clinical practice was 5 (IQR 4–6). The corresponding median score for applicability within degenerative spinal surgery was likewise 5 (IQR 5–5).

With regard to the item assessing the potential use of guidelines in clinical practice, reported scores ranged from 2 to 7 (Figure 2). The lowest score was assigned to the guideline by the Korean Acupuncture and Moxibustion Medicine Society (2022) on the management of lumbar herniated intervertebral disc in adults and the guideline by the Chinese Association of Integrative Medicine (2024) on the diagnosis and treatment of lumbar spinal stenosis using integrated traditional Chinese medicine and Western medicine. These guidelines recommend the use of alternative or traditional medicine in the treatment of respectively lumbar herniated intervertebral discs and spinal stenosis. Their low scores regarding potential use in clinical practice largely reflect the limited applicability of the guideline recommendations in mainstream clinical practice, the restricted generalisability beyond their local context and substantial concerns regarding the strength of the supporting evidence base. The highest score was given to the ASP guideline on informed consent for spinal procedures (2023). This guideline achieved a higher rating because it demonstrated methodological clarity, explicitly addressed an ethically and clinically relevant aspect of degenerative spinal care and provided clinically oriented recommendations that were considered broadly applicable across diverse healthcare settings.

Regarding the item assessing applicability within the context of degenerative spinal surgery, scores ranged from 2 to 6 (Figure 2). The lowest score was again assigned to the guidelines developed by the Korean Acupuncture and Moxibustion Medicine Society (2022) and the Chinese Association of Integrative Medicine (2024). As these guidelines advocate alternative or traditional medicine in the management of lumbar disc herniation and spinal stenosis without a sufficient evidence base, their applicability to contemporary evidence-based surgical practice was considered insufficient. Conversely, the highest scores were given to multiple, predominantly international and North American, guidelines, including those published by NASS (2011, 2013a, 2013b), AANS & CNS (2014a, 2014c, 2014d, 2014i, 2014k), NICE (2020), ACOEM (2021), ASP (2023), WHO (2023), AO Spine (2024) and WFNS (2024b). These guidelines were considered more applicable because they demonstrated methodological transparency, were underpinned by stronger evidence bases and formulated recommendations with broad clinical relevance and generalisability.

Figure 2. Box plot of AGREE GRS scores across guidelines

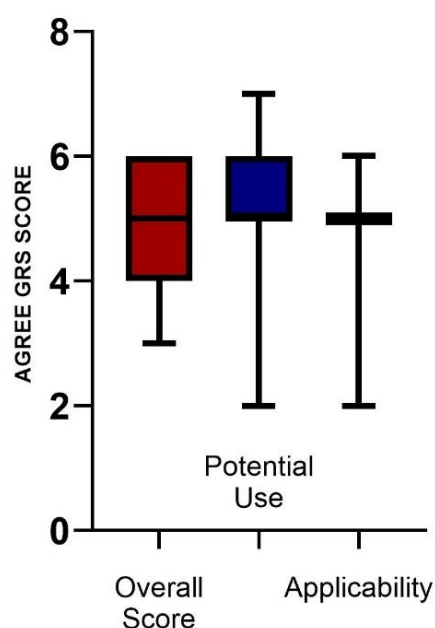


Figure 2. This box plot represents the three items used for the overall appraisal of the AGREE GRS score, each rated on a Likert scale (1-7): (1) the guideline's overall quality, which is indicated in red, (2) its potential use in clinical practice, which is indicated in blue and (3) its applicability within the context of degenerative spinal surgery which is indicated in green. Each box represents the interquartile range (IQR), with the horizontal line inside the box indicating the median. The whiskers extend to the minimum and maximum values. The median score for the three components was similar across the three items, while the IQR as well as the minimum and maximum values differed across the items.

Characteristics and classification of guideline recommendations according to Donabedian's model

The included guidelines together contained a total of 1,641 recommendations (Table 2 and Appendix 11). Of these, 121 originated from international guidelines, 589 from North American guidelines, 238 from South American guidelines, 606 from European guidelines and 87 from Asian guidelines. The median number of recommendations per guideline was 11.5 (IQR 5-28.5). The guideline with the smallest number of recommendations was a section published by the AANS and the CNS (2014d) on the correlation between radiographic and functional outcomes following lumbar fusion, which contained a single recommendation. The guideline comprising the largest number of recommendations was issued by the Ecuadorian Ministry of Public Health (2016) on the diagnosis and management of low back pain, comprising 189 recommendations.

The retrieved guideline recommendations were categorised according to Donabedian's (1980) quality framework. As outlined in the Materials and Methods section, this framework distinguishes three interrelated domains through which healthcare quality can be conceptualised, operationalised and assessed: structure, process and outcome. Within this classification, only three recommendations related to structure and 15 to outcome, while the vast majority of the guideline recommendations addressed processes of care.

The three structure-related recommendations originated from guidelines by the ASP (2019) and the Dutch Orthopaedic Association (2020). The ASP guideline on informed consent for spinal procedures (2019) specified that informed consent documents should be written at a sixth-grade reading level, thereby ensuring comprehensibility for patients. The Dutch Orthopaedic Association guideline on instrumented spinal surgery (2020) defined several infrastructural and organisational requirements for centres performing complex spinal surgery. In addition, explicit quality requirements for spinal surgeons were articulated. The 15 outcome-related recommendations originated from guidelines issued by NASS (2011) (n = 1), WFNS (2019a) (n = 2), APTA (2012) (n = 2), AANS & CNS (2014a) (n = 3), the Ecuadorian Ministry of Public Health (2016) (n = 2), the Spinal Surgery Group of the Chinese Orthopaedic Association (2015) (n = 4) and the Japanese Orthopaedic Association (2021) (n = 1). Collectively, these recommendations focused on the application and reporting of functional outcome and health-related quality of life measures. Reported PROMs include the Neck Disability Index, Short Form 12, Short Form 36, Visual Analogue Scale, Numeric Rating Scale, modified Prolo scale, Patient-Specific Functional Scale, Health Status Questionnaire, Sickness Impact Profile, Modified Million Index, McGill Pain Scores, modified Oswestry Disability Index, Rolland-Morris Disability Questionnaire, Japanese Orthopaedic Association score, Chinese Orthopaedic Association score and the Zurich Claudication questionnaire.

The remaining 1,623 recommendations were categorised as process-related recommendations. These recommendations collectively concern the diagnosis and management of degenerative spinal diseases. Across all guidelines, several process-related recommendations are consistently reiterated. Illustrative examples include the advice against the use of traction in the management of chronic low back pain (The Norwegian Communication Unit for Musculoskeletal Disorders, 2006; APTA, 2012; Ecuadorian Ministry of Public Health, 2016; Belgian Health Care Knowledge Centre, 2017; Department of Veterans Affairs, 2019; NICE, 2020; WHO, 2023), the recommendation against routinely offering opioids for chronic low back pain with or without radicular symptoms (The Norwegian Communication Unit for Musculoskeletal Disorders, 2006; Ecuadorian Ministry of Public Health, 2016; ACP, 2017; ACOEM, 2020b; Canadian Chiropractic Research Foundation, 2021; Belgian Health Care Knowledge Centre, 2017; NICE, 2020) and the recommendation against prescribing a lumbar support or brace following instrumented posterolateral lumbar fusion, as clinical outcomes are equivalent irrespective of brace use (AANS & CNS, 2014m; Dutch Orthopaedic Association, 2020).

In contradiction, some guidelines presented directly conflicting recommendations. Notable examples include the recommendation to offer acupuncture as part of care to adults with chronic primary low back pain (Ecuadorian Ministry of Public Health, 2016; ACP, 2017; Department of Veterans Affairs, 2019; ACOEM, 2020b; WHO, 2023) while this is explicitly contradicted by other guidelines (Working Group on Guidelines for Chronic Low Back Pain, 2006; Brazilian Association of Physical Medicine and Rehabilitation, 2013) and the recommendation not to use Transcutaneous Electrical Nerve Stimulation (TENS) for patients with chronic low back pain (Department of Veterans Affairs, 2019; WHO, 2023) while this is considered a valuable option in other guidelines (Working Group on Guidelines for Chronic Low Back Pain, 2006; The Norwegian Communication Unit for Musculoskeletal Disorders, 2006; Brazilian Association of Physical Medicine and Rehabilitation, 2013; Ecuadorian Ministry of Public Health, 2016; Belgian Health Care Knowledge Centre, 2017; NICE, 2020; ACOEM, 2020b). Other notable examples include the recommendation in the guideline of the Ecuadorian Ministry of Public Health (2016) against the use of any type of infiltration for acute, subacute or chronic low back pain, contrasting with several other guidelines that do recommend infiltrations, with some even specifically dedicated to this intervention. Comparably, the ACOEM guideline (2020b) explicitly advises against the use of spinal cord stimulation for low back pain, radicular pain syndromes and failed back surgery syndrome, whereas other guidelines endorse its use in selected indications.

Additionally, some recommendations no longer reflect current evidence. Examples include the recommendation by NASS (2014) to offer surgical decompression with fusion for patients with symptomatic spinal stenosis and degenerative lumbar spondylolisthesis and the recommendation by ACOEM (2020b) to prescribe lumbar supports to facilitate bony union after lumbar fusion.

Appraisal of guideline recommendations through the AGREE REX instrument

The guideline recommendations were appraised using the AGREE REX instrument. As outlined in the Materials and Methods section, this instrument consists of nine items grouped into three domains: (1) clinical credibility and applicability, (2) incorporation of stakeholder values and (3) implementability of the recommendations. Similar as in the AGREE GRS instrument, the items were scored on the Likert scale with a score of 1 signifying that the criterion is not met or that relevant information is lacking, whereas a score of 7 indicates that the criterion is clearly met. The item scores were summed to obtain the total score. To enable comparison between recommendations, the total score was normalised with equal weighting of the nine items. The full instrument is provided in Appendix 10.

A comprehensive overview of the normalised AGREE REX scores for all individual recommendations within each guideline is provided in Appendix 11, while the average normalised score per guideline is summarised in Table 2. The average normalised score for all recommendations was 68.4% (95% CI [68.2 – 68.6]), with values ranging from 37% to 93%. A tertile split of all normalised scores was performed to determine threshold scores for categorising recommendations as lower, moderate or higher quality. Recommendations with a normalised AGREE REX score of 55% or lower were considered low quality while those with a score of 70% or higher were considered high quality. The lowest scores were assigned to recommendations with limited clinical credibility, insufficient consideration of patient and clinician values, and challenging implementability. Illustrative examples include the suggestion that ozone injections and cervical halter traction may be considered for the treatment of cervical radiculopathy while the absence of demonstrated benefit is acknowledged (NASS, 2011), the recommendation to use the traditional formula of Duhuo Jisheng Decoction for the treatment of lumbar spinal stenosis (Chinese Association of Integrative Medicine, 2024), the advice to consider thoracic discography to diagnose thoracic discogenic disease even while the procedural risks are admitted (ASIPP, 2013) and the recommendation to use ultrasound for the treatment of disc-related pain and hydrotherapeutic procedures for the treatment of acute radicular symptoms (German Spine Society, 2020). Conversely, the highest scores were given to recommendations with a strong evidence base, clear consideration of patient and clinician values, and high clinical applicability. Illustrative examples include the recommendation to not use routine x-ray for acute nonspecific low back pain (ACOEM 2020a), the directive to urgently refer patients with a diagnosis of cauda equina syndrome to secondary care (Ecuadorian Ministry of Public Health, 2016) and the recommendation against lumbar fusion in patients with lumbar stenosis in the absence of deformity or instability, as this has not shown to improve outcomes and carries procedural risks (AANS & CNS, 2014i).

The average normalised AGREE REX score was 67.9% (95% CI [66.3 – 69.5]) for international, 68.9% (95% CI [68.1 – 70.7]) for North American, 66.3% (95% CI [65.3 – 67.3]) for South American, 69.2% (95% CI [68.6 – 69.8]) for European and 65.3% (95% CI [62.9 – 67.7]) for Asian recommendations. In order to determine whether the normalised AGREE REX scores differed significantly between continents, a statistical comparison was conducted.

To verify whether the assumptions required for parametric testing were met, residuals within each group were examined for normality using the Shapiro–Wilk and Kolmogorov–Smirnov test, followed by visual inspection of QQ plots. Although the normality tests indicated a deviation from normality ($p < 0.001$), inspection of the QQ plots showed that the data were consistent with a normal distribution (Figure 3). As the normality tests were inevitably influenced by the large sample size and the QQ plots showed no substantive deviations, the use of parametric tests was deemed appropriate. Subsequently, the assumption of homogeneity of variances was examined using Levene’s test. This test was significant ($p < 0.001$), indicating that the assumption of homogeneity of variances required for standard ANOVA was not satisfied. Consequently, Welch’s ANOVA was considered the most appropriate statistical test, as it offers a robust alternative to the standard one-way ANOVA in the presence of heteroscedasticity and unequal group sizes. The Welch’s ANOVA test revealed a significant difference in AGREE REX scores between continents ($p < 0.001$). Post-hoc pairwise comparisons using the Games–Howell test showed that North American and European recommendations scored significantly higher than South American recommendations ($p < 0.001$) with a mean difference of respectively 2.6% (95% CI [0.9 – 4.4]) and 3.0% (95% CI [1.4– 4.6]). No other pairwise comparisons between continents reached statistical significance ($p > 0.05$). An overview of the individual data points illustrating the distribution of AGREE REX scores across continents is provided in Figure 4.

In contrast to the inferential analyses restricted to broader group comparisons, a direct statistical comparison of the normalised AGREE REX scores of all 78 guidelines was not undertaken, since such an analysis would have yielded numerous pairwise results with limited interpretability. Moreover, directly comparing the average AGREE REX scores of guidelines would ignore their structural differences, such as the number and scope of included recommendations. Instead, an overview of the average AGREE REX score per guideline is provided in Table 2 and a comprehensive overview of the normalised AGREE REX scores for all individual recommendations within each guideline is provided in Appendix 11. The guideline with the highest average normalised AGREE REX score was published by AANS & CNS on the assessment of functional outcome following lumbar fusion (2014a) and scored 89.0% (95% CI [83.0 – 95.0]). The lowest average normalised score was given to the guideline developed by the Chinese Association of Integrative Medicine on the diagnosis and treatment of lumbar spinal stenosis using integrated traditional Chinese medicine and Western medicine (2024), which scored 50.5% (95% CI [45.7 – 55.3]).

Figure 3. QQ plot assessing normality of the normalised AGREE REX scores per continent

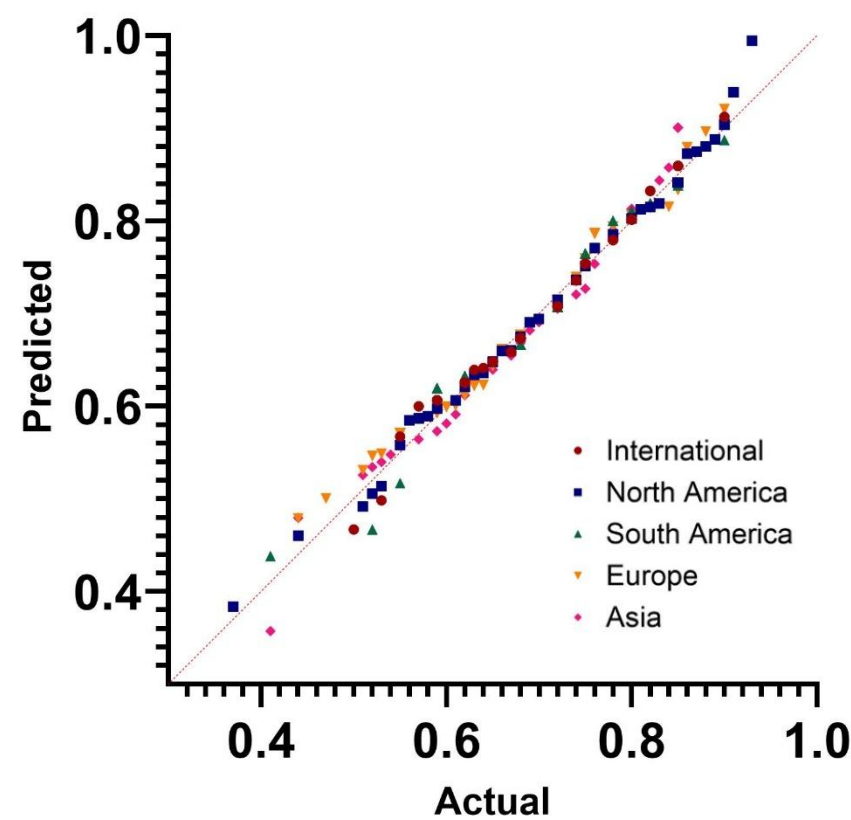


Figure 3. QQ plot illustrating the distribution of normalised AGREE REX scores per continent. Recommendations from guidelines issued by international organisations are depicted as red circles, from North America as blue squares, from South America as green upward pointing triangles, from Europe as yellow downward pointing triangles and from Asia as pink rhombi. The plot compares the distribution of the observed data against the theoretical quantile of normal distribution. As the data align with normal distribution, the points fit closely to the reference line. Only minor deviations were observed, but no substantive departures from normality.

Figure 4. Violin plot of the normalised AGREE REX scores per continent

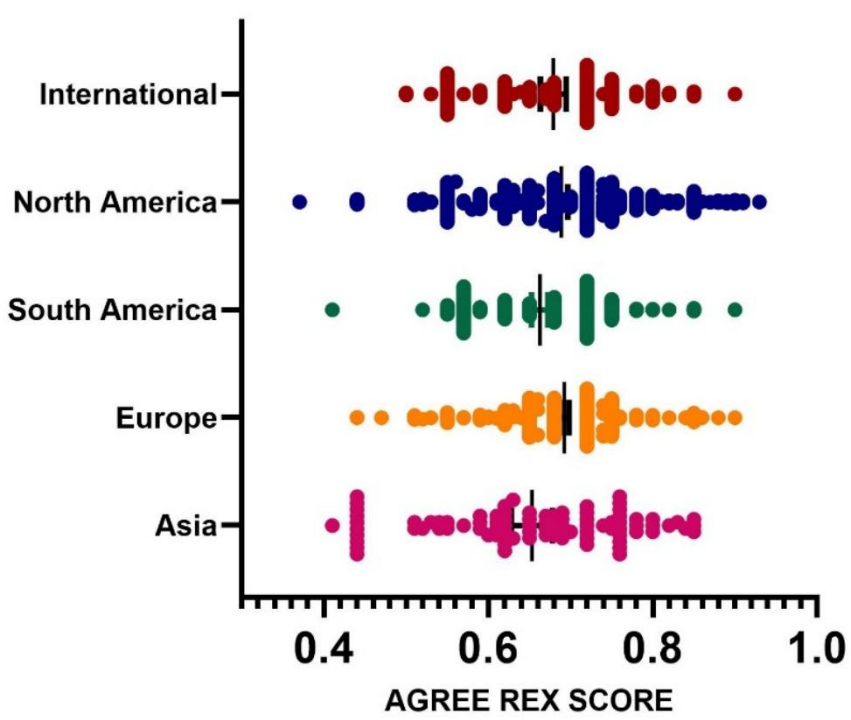


Figure 4. Violin plot with individual data points illustrating the distribution of AGREE REX scores across continents. Recommendations from guidelines issued by international organisations are depicted in red, from North America in blue, from South America in green, from Europe in yellow and from Asia in pink. The vertical black lines indicate the mean score with 95% confidence intervals, which appear narrow due to the large sample sizes. This visualisation allows comparison of the distribution and central tendency of recommendation quality across regions.

Discussion

The absence of quality indicators in degenerative spinal surgery: a barrier to quality improvement

This systematic review constitutes the first comprehensive synthesis of both existing quality indicators and guideline recommendations in degenerative spinal surgery. All included articles consisted of clinical practice guidelines. Despite the comprehensive search strategy and inclusive eligibility criteria, no articles were identified that reported the development, evaluation or use of quality indicators for degenerative spinal surgery. Some recommendations, such as 'Contrast-enhanced fluoroscopy is recommended to guide epidural steroid injections to improve the accuracy of medication delivery for treatment of lumbar disc herniation with radiculopathy' (NASS, 2014) demonstrated congruence with elements of the NICE (2019) criteria for quality indicator development, including an implied target population (denominator) and a defined outcome group (numerator). However, this was inconsistently specified, and explicit inclusion and exclusion criteria were absent throughout. Similarly, the criteria for IQTIG (2024) quality indicators were consistently unmet, as recommendations failed to include both a coherent measurement concept and a structured quality appraisal or interpretation framework.

These findings are consistent with the conclusions of a systematic review on quality indicators in spinal surgery by St. Pierre *et al.* (2018), which performed a literature search up to 2016 and similarly failed to identify any validated quality indicators in spinal surgery. They argued that more rigorous conceptual and methodological frameworks are needed to evaluate both care quality and patient outcomes. Paradoxically, a systematic review by Bennett *et al.* (2018) reported the identification of 74 quality indicators, extracted from guidelines published by three North American organisations: the American Academy of Orthopaedic Surgeons, CNS and NASS. However, detailed examination of their dataset revealed that the purported quality indicators actually corresponded to guideline recommendations, suggesting that a conceptual conflation may have occurred.

The lack of formal quality indicators in degenerative spinal surgery is striking given the increasing global prevalence of degenerative spinal disorders, the rising demand for surgical interventions, and the substantial economic and societal burden associated with these conditions. This gap becomes even more pronounced when contrasted with other medical and surgical disciplines, where the application of quality indicators is firmly embedded within clinical practice. Across multiple specialties and settings, quality indicators serve as integral tools for monitoring performance and driving continuous quality improvement. A notable example is provided by the American College of Surgeons National Surgical Quality Improvement Program which provides validated quality indicators in general surgery to inform and drive quality improvement. This has resulted in statistically significant reductions in postoperative mortality, morbidity and surgical site infections in participating hospitals (Cohen *et al.*, 2016).

Systemic and methodological challenges for the development of quality indicators

The absence of quality indicators in degenerative spinal surgery can arguably be attributed to a combination of systemic and methodological challenges. One possible reason relates to the inherent complexity and heterogeneity of degenerative spinal conditions. In contrast to traumatic and neoplastic spinal pathologies, where surgical indications are typically guided by well-defined clinical criteria and outcomes such as bony union or extent of tumour resection can be measured with relative objectivity, surgical decision-making and outcome evaluation in degenerative spinal surgery is more variable. This heterogeneity is partially due to the fact that the decision to perform surgery can vary considerably between surgeons, and that clinical and radiological findings alone have a limited ability to fully account for postoperative outcomes in degenerative spinal surgery. Non-clinical influences such as preoperative expectations and psychosocial factors also substantially affect how treatment success is ultimately perceived. The case-mix diversity, compounded by variability in surgical decision-making, perioperative management and outcome measurement, complicates the definition of standardised and universally applicable denominators and numerators, as well as explicit inclusion and exclusion criteria, which both are essential for the operationalisation of quality indicators (NICE, 2019).

Second, another major challenge arises from the lack of conceptual clarity regarding the definition of quality in degenerative spinal surgery. As Resnick (2023) observed: ‘The definition of quality (in spinal surgery) depends, to a great extent, upon the perspective of the observer. For example, a patient may define quality as a reduction in pain or an improvement in performance. A surgeon may define quality as a high arthrodesis or low infection rate. A hospital system may equate quality with a high-volume, high-margin practice. A health care insurer may define a quality spinal programme as one that treats the most patients at the lowest cost.’ The fundamental epistemological and methodological debate surrounding the definition of quality within the context of degenerative spinal surgery was already observed more than 30 years ago (Frymoyer, 1993). The persistence of this ambiguity can partially be explained by the limited availability of high-quality evidence in the management of degenerative spinal disorders. As long as a clear and explicit definition of quality remains absent, the formulation of a structured quality appraisal or interpretation framework, one of the essential components of a robust quality indicator according to IQTIG (2024), cannot be achieved. A shared understanding of quality is therefore essential to support the development of quality indicators.

A third possible explanation concerns the systemic fragmentation and lack of standardisation in data collection in spinal surgery. In response to the challenges of defining and measuring quality in spinal surgery, national and international comprehensive spinal registries have been established over the last decades with the aim of harmonising data collection and identifying practice variation. However, considerable misalignment across registries persists regarding which periprocedural variables and treatment outcomes are collected. This inconsistency is driven not only by variations in diagnostic coding, surgical technique reporting and outcome measurement, but also by diverse institutional priorities and resource constraints (Meyer *et al.*, 2020). This fragmentation undermines comparability across registries and substantially limits their capacity to drive continuous quality improvement or support the development and implementation of quality indicators. Mitigating these shortcomings will likely require international initiatives that establish common data standards and foster interoperability between registry platforms (Pascucci *et al.*, 2023).

Organisational and financial barriers represent another major obstacle to the development of quality indicators. Developing and implementing quality indicators requires systematic data collection, which requires considerable financial resources, trained personnel and administrative support. However, in many organisations, financial investments are preferentially directed towards areas with immediate measurable outcomes or established benchmarks, where a return on investment can be more easily demonstrated (Porter, 2010). By contrast, in degenerative spinal surgery, established benchmark frameworks are not readily available and improvements in patient symptoms often accrue more gradually (Fekete *et al.*, 2016). This complicates both the justification for upfront investment and the demonstration of measurable impact, limiting the willingness of institutions and funding bodies to support the development and implementation of quality indicators.

Finally, regulatory and cultural concerns constitute another important barrier. Experiences from other medical domains demonstrate that political and cultural resistance can obstruct well-designed quality improvement initiatives (Carbonell *et al.*, 2024). Surgeons may fear that quality indicators could be applied in a punitive rather than constructive manner, that the resulting data could be misinterpreted or that their professional autonomy could be compromised. McNeil *et al.* (2001) described these concerns as ‘hidden barriers’, emphasising that even when robust guidelines and recommendations are available, their transformation into measurable and auditable quality indicators may be undermined if assumptions regarding objectives, workflows and incentives are not aligned with the realities of clinical practice. In spinal surgery, this misalignment likely contributes to the limited progress in translating guideline recommendations to operationalised quality indicators (Jiang *et al.*, 2020).

Methodological principles: developing quality indicators from guidelines

The absence of quality indicators in degenerative spinal surgery does not imply a lack of value, but rather underscores their untapped potential and the urgent need for structured frameworks capable of addressing the previously identified systemic and methodological obstacles. To ensure robustness and validity, quality indicators should be grounded in scientific evidence and developed through systematic, transparent and participatory processes. The most widely adopted and best documented strategy is to derive them from clinical practice guidelines (Deckert *et al.*, 2019). The NICE (2019) and IQTIG (2024) methodologies exemplify this principle. Some scholars even argue for a more explicit integration of guideline and indicator development to enhance methodological coherence and clinical relevance (Langendam *et al.*, 2020). The development of quality indicators generally follows a multi-stage process encompassing topic selection, evidence synthesis, translation of recommendations into measurable elements, consensus building and iterative validation with piloting to assess feasibility, test validity and identify potential unintended consequences (Campbell *et al.*, 2002). This structured and transparent process safeguards scientific validity while maintaining alignment with clinical practice, stakeholder priorities and the evolving demands of health systems.

This process fundamentally relies on high-quality guidelines to ensure that quality indicators reflect best practice recommendations. Robustly developed guidelines provide a credible foundation for quality indicator development, whereas poorly developed guidelines risk producing weak indicators with limited validity and clinical credibility. According to the IOM (2011), high-quality guidelines should be developed through a transparent process with the involvement of a multidisciplinary development group, explicit conflict of interest management and reliance on a robust systematic review. Each recommendation should be explicitly linked to its supporting evidence, formulated in a precise and actionable manner, subjected to broad external stakeholder review and accompanied by a clearly defined updating procedure. To achieve this, guideline developers commonly employ structured consensus methods such as the Delphi technique, nominal group processes or the RAND/UCLA Appropriateness Method, which help translate evidence into clear recommendations while balancing diverse perspectives (Shekelle *et al.*, 1999; WHO, 2014). Against this methodological background, it is essential to appraise existing guidelines to determine the extent to which they meet these standards and can reliably inform quality indicator development.

This systematic review identified a total of 78 guidelines concerning degenerative spinal surgery. Half of these originated from North American organisations while the others were issued by international, European, South American and Asian societies or consortiums. No African guidelines could be found, echoing prior observations by Ahenkorah *et al.* (2019). The majority of the guidelines were lumbar-focused. Most guidelines focused on surgical indications and techniques or combined diagnostic and therapeutic aspects. The methodological quality of the retrieved guidelines was appraised using the AGREE GRS instrument. This validated tool, derived from the more comprehensive AGREE II instrument, provides a concise and pragmatic approach to evaluating and quantifying guideline quality. Reliability testing has shown that the AGREE GRS produces results comparable to AGREE II, despite lower sensitivity in detecting differences in guideline quality (Brouwers *et al.*, 2020). The AGREE GRS instrument was selected over the Grading of Recommendations Assessment, Development and Evaluation (GRADE) instrument because the latter primarily rates the certainty of evidence and strength of recommendations within a guideline, rather than the methodological quality of guideline development (Guyatt *et al.*, 2008).

The overall appraisal of the AGREE GRS instrument involved scoring three items: (1) the guideline's overall quality, (2) its potential use in clinical practice and (3) its applicability within the context of degenerative spinal surgery. The first item may be regarded as relatively objective, whereas the latter two are inherently more subjective in nature. The items were scored on a Likert scale (1-7), a frequently used method for capturing subjective evaluations along an ordered scale. However, the use of this scale is not without limitations. A principal concern is that the intervals between the categories of the Likert scale cannot be assumed to be equal, which limits both interpretability and reproducibility. For instance, the difference between a rating of 1 and 2 may not reflect the same magnitude of judgment shift as between 3 and 4. This limitation is well recognised in methodological literature, where Likert data are considered ordinal rather than interval in nature (Jamieson, 2004). An additional concern is that all items were rated solely by the corresponding author, which may have potentially introduced rater and confirmation bias. This may further limit reproducibility, although the structured format of the AGREE GRS instrument is designed to standardise ratings across appraisers (Brouwers *et al.*, 2010).

The appraisal revealed variability in methodological quality across the included guidelines. Those that received the highest ratings were predominantly produced by international, North American or European organisations and consistently adhered to principles of methodological rigour, incorporating several of the criteria outlined by the Institute of Medicine (2011) for robust guidelines. In contrast, lower-scoring guidelines provided insufficient methodological reporting or exhibited major limitations, which undermined both their credibility and practical utility. The observed regional differences in guideline quality are arguably attributable to disparities in resources, methodological expertise and institutional support to evidence-based guideline development, as previously observed by Florez *et al.* (2020) in their appraisal of 161 guidelines. The observed variability could also reflect other healthcare priorities, cultural expectations and reimbursement structures.

The other two items of the AGREE GRS instrument, which assessed the potential use of guidelines in practice and their applicability within the context of degenerative spinal surgery, yielded scores comparable to the first item. Guidelines that were grounded in strong evidence and explicitly addressed clinically and ethically important issues, such as informed consent, were perceived as broadly relevant across diverse healthcare settings. In contrast, guidelines advocating traditional or alternative medicine received the lowest applicability ratings, largely due to concerns regarding their limited generalisability and poor alignment with contemporary surgical evidence-based standards. As stated previously, the rating of these items is inherently more subjective and should therefore be interpreted with caution.

Guideline recommendations in degenerative spinal surgery: insights from the qualitative appraisal

The included guidelines together contained a total of 1,641 recommendations, with most originating from North American and European guidelines. Across all guidelines, several recommendations were consistently reiterated. This repetition may in part reflect convergence of expert opinion, but it also suggests that certain guidelines were developed with reference to, or directly adapted from, previously published guidelines. For instance, the guideline by the Belgian Health Care Knowledge Centre on low back pain (2017) explicitly drew upon and adapted the methodology and recommendations of the NICE guideline (2020). While cross-referencing fosters greater consistency across healthcare systems, it also risks narrowing the range of perspectives incorporated into guideline development. Additionally, reliance on previously published guidelines risks amplifying any methodological weaknesses or biases of the original publications, thereby perpetuating their limitations across successive adaptations. Finally, contextual differences in healthcare organisation and resource availability may not be adequately addressed when recommendations are directly transferred from one setting to another.

In contradiction, some guidelines contained directly opposing recommendations or no longer reflected the most up-to-date evidence. This observation is consistent with the findings of Bennett *et al.* (2018), who extracted recommendations from three North American organisations and identified multiple recommendations that were in direct opposition to one another. Such inconsistencies are not isolated to spinal surgery but have also been described in other medical domains (Lenzer, 2013). The presence of contradictory recommendations across guidelines poses significant challenges for clinicians, as it complicates decision-making, undermines standardisation of care and may ultimately erode trust in the legitimacy of guidelines as tools for evidence-based practice. Such inconsistencies may also confuse patients and weaken confidence among policymakers.

The extracted recommendations were categorised according to Donabedian's (1980) quality framework, which differentiates three interrelated domains of healthcare quality: structure, process and outcome. Of the retrieved recommendations, only three were related to structural aspects of care and 15 were outcome-focused. The vast majority, however, pertained to processes of care, with a strong emphasis on the diagnosis and management of degenerative spinal conditions. Previous evaluations across different medical domains have drawn similar conclusions, noting that recommendations most often specify what clinicians should do rather than what health systems should provide or which outcomes should be achieved. Mainz (2003) noted that methodological and feasibility constraints often lead to an over-reliance on process indicators. As Campbell *et al.* (2002) stated: 'The majority of indicators and recommendations currently in use are process based, reflecting the relative ease with which processes can be defined and measured compared with outcomes or structures.'

The predominance of process-oriented recommendations may partly reflect the characteristics of the existing body of evidence. After all, randomised and observational studies most frequently examine the comparative effectiveness of diagnostic procedures or therapeutic interventions, while generating robust evidence on organisational structures or sustained long-term outcomes is considerably more challenging. In addition, structural recommendations often require national policy decisions, which fall beyond the remit of many guideline panels. Similarly, the formulation of outcome recommendations is constrained by the heterogeneity of degenerative spinal conditions and the variability of patient-reported outcomes.

The relative underrepresentation of structure- and outcome-related recommendations has important implications. Donabedian (1980) conceptualised quality as a dynamic interplay between structures, processes and outcomes. This sequential interrelationship underscores that healthcare quality cannot be meaningfully assessed by outcomes alone, but must also consider the processes and contexts that give rise to them. He emphasised that process improvements alone are unlikely to yield sustained benefits unless they are embedded within supportive structures and linked to meaningful outcomes. Or, as Mant (2001) argued in his critical analysis of process indicators in healthcare quality assessment: 'If there is no evidence that a measure of process is linked to outcome, then there is little justification for using such a measure.'

Guideline recommendations in degenerative spinal surgery: insights from the AGREE REX appraisal

Following qualitative appraisal and categorisation of the retrieved guideline recommendations, these were further evaluated using the AGREE REX instrument. This tool, developed as a complement to the AGREE GRS, has been validated as a reliable method for assessing the quality of individual recommendations (Brouwers *et al.*, 2020). Similar as the AGREE GRS instrument, items were rated on a Likert scale solely by the corresponding author, which entails the previously discussed concerns regarding interpretability and the potential introduction of rater and confirmation bias. This limitation may restrict reproducibility, although the structured design of the AGREE REX instrument is designed to standardise ratings across appraisers.

In accordance with the instrument's methodology, the resulting scores were subsequently normalised to facilitate comparison between recommendations. Normalisation typically rescales the raw ordinal scores, thereby enabling aggregation and cross-comparison. However, this procedure rests on the implicit assumption that the ordinal categories are equidistant. As this assumption cannot be confirmed, the normalised scores should be interpreted cautiously, with the results regarded primarily as relative indicators rather than exact measurements (Jamieson, 2004; Norman, 2010). Furthermore, as Brouwers *et al.* (2020) noted, the calculation of these normalised scores applies equal weighting to all items, despite limited evidence regarding their relative importance in determining recommendation quality. Consequently, the overall scores do not provide detailed insights into the specific strengths and weaknesses of the guideline recommendations on their own. Nonetheless, they offer a pragmatic means of summarising and comparing the quality of recommendations across multiple guidelines.

The appraisal indicated a moderate overall quality of guideline recommendations, with substantial variability reflecting heterogeneity in methodological rigour. As suggested in the methodology of the AGREE REX instrument, a tertile split was performed in order to categorise recommendations into low, moderate or high quality. Recommendations with a normalised AGREE REX score of 55% or lower were considered low quality while those with a score of 70% or higher were considered high quality. The highest scores were given to recommendations with a strong evidence base, explicit consideration of patient and clinician values, and high clinical applicability. Conversely, the lowest scores were assigned to recommendations with limited clinical credibility, insufficient consideration of stakeholder values, and challenging practical implementability. The AGREE REX scores are consistent with the results of previous AGREE REX appraisals in different clinical contexts, which have similarly reported a moderate overall quality of guideline recommendations with comparable score distributions (Dijkers *et al.*, 2020; Lim *et al.*, 2024).

Direct pairwise comparisons of AGREE REX scores across all individual guidelines were not performed, as this would have yielded numerous results of limited interpretability and overlook structural differences in scope, methodology and content. In addition, such analyses would artificially inflate the risk of type I error due to the large number of pairwise tests, while offering limited additional insight beyond broader group comparisons. Moreover, the retrieved guideline recommendations vary substantially in the number of recommendations per guideline and thematic focus, which would make pairwise comparisons prone to bias from unequal weighting and contextual heterogeneity. Instead, differences in AGREE REX scores were assessed at the continental level to provide more meaningful aggregate comparisons. This approach follows the methodology of Florez *et al.* (2020), which advocates examining broader geographic patterns rather than conducting exhaustive pairwise testing.

The comparative analysis across continents was conducted subsequent to confirmation of the most appropriate statistical test. In accordance with the methodological guidance by Ghasemi and Zahedias (2012), normality was examined through a combination of statistical and graphical methods. Both the Shapiro–Wilk and Kolmogorov–Smirnov tests indicated departures from normality. This finding was not unexpected given the large sample size, as such tests are highly sensitive and may detect even minor deviations from a normal distribution. Visual inspection of the QQ plots, however, did not reveal substantive departures from normality, supporting the robustness of parametric testing in this context. Welch’s ANOVA was applied to account for unequal variances and identified a statistically significant but clinically unimportant difference between the AGREE REX score of South American and North American/European recommendations. This difference may be attributable to a different sample size or contextual healthcare factors rather than to any meaningful difference. Taken together, these findings indicate that guideline recommendations across continents are broadly consistent in quality.

Future perspectives

Through the identification, categorisation and appraisal of existing clinical practice guidelines and their recommendations, the insights derived from this systematic review may provide a foundation for the translation of recommendations into quality indicators. Ideally, this should be performed by a multidisciplinary expert panel in line with the NICE (2019) or IQTIG (2024) frameworks to ensure both methodological rigour and clinical relevance. In these methodologies, guideline recommendations are systematically appraised, prioritised for indicator development by advisory committees and piloted to assess feasibility, validity and potential unintended consequences. When appropriately developed, quality indicators can capture both clinical effectiveness and patient experience, thereby supporting continuous improvements in care delivery and generating actionable changes in clinical practice.

Additionally, by uncovering underrepresented domains of care, the results of this review may inform spinal registries and support the ongoing transition towards patient-centred, value-based healthcare. Currently, substantial variation persists in how periprocedural data and treatment outcomes are collected across spinal registries. Harmonisation of data collection across professional societies and healthcare systems could reduce duplication and improve comparability. Moreover, by streamlining data collection and systematically incorporating underrepresented domains, spinal registries may become more robust tools for monitoring practice and driving continuous improvements in care delivery and patient outcomes. The integration of real-world data from electronic health records and emerging digital health technologies could offer an additional opportunity to further strengthen the validity and reliability of spinal registries, fostering more dynamic and context-sensitive approaches to quality measurement.

Finally, as has become apparent through the appraisal of existing guidelines in degenerative spinal surgery, not all guidelines are developed in accordance with established standards. According to the IOM (2011), the development of guidelines should involve a transparent process, multidisciplinary involvement, explicit conflict of interest management and reliance on robust systematic reviews. Recommendations should be explicitly linked to their supporting evidence, formulated in a precise and actionable manner, subjected to broad external stakeholder review and accompanied by a clearly defined updating procedure. Strengthening methodological rigour and adopting harmonised international standards will be critical to ensure comparability and reliability of future guidelines.

Strengths and limitations

The strengths of this review include a structured and transparent methodology, informed by expert guidance from medical librarians at the Bodleian Healthcare Libraries. The protocol was prospectively registered in PROSPERO prior to data extraction and no deviations from the registered protocol occurred during the review process. Three bibliographic databases and grey literature sources were systematically searched, supplemented by citation tracking and Google Scholar cross-referencing. The systematic review was conducted in adherence with PRISMA (2020) and encompassed guidelines from multiple continents, healthcare systems and languages. Additional strengths include the integration of qualitative appraisal with quantitative analysis, which was supported by validated and reliable appraisal instruments.

Although the study followed a structured and transparent methodology, several limitations must also be acknowledged. First, this systematic review focused exclusively on clinical practice guidelines and did not include consensus statements, position papers or local institutional guidelines. While this restriction was necessary to ensure methodological consistency, it may have excluded potentially informative sources. Second, all appraisals were conducted by the corresponding author. Although the used instruments are specifically designed to standardise ratings across appraisers, this could have potentially introduced rater and confirmation bias. Third, the used appraisal instruments have inherent limitations. Although it produces comparable results, the AGREE GRS instrument is less sensitive than AGREE II in detecting methodological weaknesses. The AGREE REX instrument, in turn, assigns equal weighting to all items, despite the lack of evidence regarding their relative importance in determining recommendation quality. Furthermore, the normalised scores require cautious interpretation, as they should be regarded primarily as relative scores rather than precise measurements. Small differences in scores may not reflect meaningful variations in quality and their interpretation should always be contextualised within the broader methodological strengths and weaknesses of the underlying guidelines. Finally, this review was limited to degenerative spinal surgery. While this focus enhances specificity, it precludes extrapolation to other spinal pathologies.

Conclusion

Degenerative spinal diseases are among the most important causes of disability worldwide, with a rising prevalence and corresponding increase in treatment demand. However, substantial uncertainty persists in both surgical decision-making and outcome assessment. Therefore, there is a growing and compelling need to ensure that care is delivered in a patient-centred and value-based manner. This systematic review constitutes the first comprehensive synthesis of both existing quality indicators and guideline recommendations in degenerative spinal surgery. Despite the comprehensive search strategy and inclusive eligibility criteria, no studies were identified that reported the development, evaluation or use of quality indicators for degenerative spinal surgery. This underscores a critical disconnect between the widespread prevalence and impact of degenerative spinal diseases and the absence of established mechanisms to evaluate and improve care quality.

The absence of quality indicators in degenerative spinal surgery likely reflects a combination of systemic and methodological challenges. First, the inherent complexity and heterogeneity of degenerative spinal conditions complicate the development of standardised and universally applicable indicators. Second, another major challenge arises from the lack of conceptual clarity regarding the definition of quality in degenerative spinal surgery, partly attributable to the limited availability of high-quality evidence in the management of these conditions. Third, there is a fragmentation and lack of standardisation in data collection across spinal registries, which undermines comparability and limits the capacity of these registries to support the development and implementation of quality indicators. Fourth, the difficulty of demonstrating measurable impact in degenerative spinal surgery complicates the justification for upfront investment, as funding is often directed towards areas with immediate outcomes or established benchmarks where a return on investment can be more easily demonstrated. Finally, variability in regulatory frameworks and professional cultures may further hinder the development of quality indicators.

Through the identification, categorisation and appraisal of existing clinical practice guidelines and their recommendations, the insights derived from this systematic review are intended to serve as a foundation for the translation of recommendations into quality indicators. Ideally, this should be performed by a multidisciplinary expert panel to ensure methodological rigour and clinical relevance. Additionally, the findings of this review may inform spinal registries and help harmonise data collection, thereby strengthening their role as tools for monitoring practice, driving continuous improvements in care delivery and advancing patient outcomes. Ultimately, the insights from this manuscript may contribute to reducing the chasm between the care we have and the care we could have.

References

Ahenkorah, J. *et al.* (2019) 'Chronic low back pain beliefs and management practices in Africa: Time for a rethink?', *Musculoskeletal Care*, 17(4), pp. 376-81. doi: 10.1002/msc.1424

Agency for Healthcare Research and Quality (2016) *Understanding quality measurement*. Rockville, Maryland. Available at: <https://www.ahrq.gov/talkingquality/measures/understand/index.html> (Accessed: 1 May 2025)

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014a) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: Assessment of functional outcome following lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 7-13. doi: 10.3171/2014.4.SPINE14258

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014b) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 3: Assessment of economic outcome', *Journal of Neurosurgery: Spine*, 21(1), pp. 14-22. doi: 10.3171/2014.4.SPINE14259

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014c) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 4: radiographic assessment of fusion status', *Journal of Neurosurgery: Spine*, 21(1), pp. 23-30. doi: 10.3171/2014.4.SPINE14267

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014d) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: Correlation between radiographic outcome and function', *Journal of Neurosurgery: Spine*, 21(1), pp. 31-6. doi: 10.3171/2014.4.SPINE14268

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014e) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 6: Discography for patient selection', *Journal of Neurosurgery: Spine*, 21(1), pp. 37-41. doi: 10.3171/2014.4.SPINE14269

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014f) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 7: lumbar fusion for intractable low-back pain without stenosis or spondylolisthesis', *Journal of Neurosurgery: Spine*, 21(1), pp. 42-7. doi: 10.3171/2014.4.SPINE142704

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014g) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 8: Lumbar fusion for disc herniation and radiculopathy', *Journal of Neurosurgery: Spine*, 21(1), pp. 48-53. doi: 10.3171/2014.4.SPINE14271

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014h) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 9: Lumbar fusion for stenosis with spondylolisthesis', *Journal of Neurosurgery: Spine*, 21(1), pp. 54-61. doi: 10.3171/2014.4.SPINE14274

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014i) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 10: lumbar fusion for stenosis without spondylolisthesis', *Journal of Neurosurgery: Spine*, 21(1), pp. 62-6. doi: 10.3171/2014.4.SPINE14275

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014j) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 11: Interbody techniques for lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 67-74. doi: 10.3171/2014.4.SPINE14276

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014k) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 12: Pedicle screw fixation as an adjunct to posterolateral fusion', *Journal of Neurosurgery: Spine*, 21(1), 75-8. doi: 10.3171/2014.4.SPINE14277

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014l) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 13: injection therapies, low-back pain, and lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 79-90. doi: 10.3171/2014.4.SPINE14281

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014m) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 14: Brace therapy as an adjunct to or substitute for lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 91-101. doi: 10.3171/2014.4.SPINE14282

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014n) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 15: Electrophysiological monitoring and lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 102-5. doi: 10.3171/2014.4.SPINE14324

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014o) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 16: Bone graft extenders and substitutes as an adjunct for lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 106-32. doi: 10.3171/2014.4.SPINE14325

American Association of Neurological Surgeons & Congress of Neurological Surgeons (2014p) 'Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 17: Bone growth stimulators as an adjunct for lumbar fusion', *Journal of Neurosurgery: Spine*, 21(1), pp. 133-9. doi: 10.3171/2014.4.SPINE14326

American College of Occupational and Environmental Medicine (2020a) 'ACOEM guidelines: Diagnostic tests for low back disorders', *Journal of Occupational and Environmental Medicine*, 61(4), pp. 155-68. doi: 10.1097/JOM.0000000000001551

American College of Occupational and Environmental Medicine (2020b) 'ACOEM guidelines: Non-invasive and minimally invasive management of low back disorders', *Journal of Occupational and Environmental Medicine*, 62(3), pp. 111-38. doi: 10.1097/JOM.0000000000001812

American College of Occupational and Environmental Medicine (2021) 'ACOEM guidelines: Invasive treatments for low back disorders', *Journal of Occupational and Environmental Medicine*, 63(4), pp. 215-41. doi: 10.1097/JOM.0000000000001983

American College of Physicians (2017) 'Non-invasive treatments for acute, subacute and chronic low back pain: A clinical practice guideline from the American College of Physicians', *Annals of Internal Medicine*, 166(7), pp. 514-30. doi: 10.7326/M16-2367

American College of Radiology (2021) 'American College of Radiology appropriateness criteria. Myelopathy: 2021 update', *Journal of the American College of Radiology*, 18(5), pp. S73-S82. doi: 10.1016/j.jacr.2021.01.020

American Pain Society (2009) 'Interventional therapies, surgery and interdisciplinary rehabilitation for low back pain: An evidence-based clinical practice guideline from the American Pain Society', *Spine*, 34(10), pp. 1066-77. doi: 10.1097/BRS.0b013e3181a1390d

American Physical Therapy Association (2012) 'Low back pain - Clinical practice guidelines linked to the international classification of functioning, disability and health from the orthopaedic section of the American Physical Therapy Association', *The Journal of Orthopaedic and Sports Physical Therapy*, 42(4), pp. A1-57. doi: 10.2519/jospt.2012.42.4.A1

American Society of Interventional Pain Physicians (2013) 'An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations', *Pain Physician*, 16(2), pp. S49-283.

American Society of Interventional Pain Physicians (2020) 'Comprehensive evidence-based guidelines for facet joint interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians Guidelines', *Pain Physician*, 23(3), pp. S1-S127.

American Society of Interventional Pain Physicians (2021) 'Epidural interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians comprehensive evidence-based guidelines', *Pain Physician*, 24(1), pp. S27-S208.

American Society of Pain and Neuroscience (2022) 'The American Society of Pain and Neuroscience evidence-based clinical guideline of interventional treatments for low back pain', *Journal of Pain Research*, 6(15), pp. 3729-832. doi: 10.2147/JPR.S386879

American Society of Pain and Neuroscience (2023) 'Informed consent for spine procedures: best practice guideline from the American Society of Pain and Neuroscience', *Journal of Pain Research*, 16, pp. 3559-68. doi: 10.2147/JPR.S418261

American Spine Registry (2025) *Annual Report 2025*. American Association of Neurological Surgeons & American Academy of Orthopaedic Surgeons. Available at: <https://connect.registryapps.net/2025-asr-annual-report> (Accessed: 3 May 2025)

AO Spine (2024) 'AO Spine guideline for the use of osteobiologics (AOGO) in anterior cervical discectomy and fusion for spinal degenerative cases', *Global Spine Journal*, 14(2), pp. 6S-13S. doi: 10.1177/21925682231178204

AO Spine North America & Cervical Spine Research Society (2017) 'A clinical practice guideline for the management of patients with degenerative cervical myelopathy: recommendations for patients with mild, moderate, and severe disease and nonmyelopathic patients with evidence of cord compression', *Global Spine Journal*, 7(3), pp. 70S-83S. doi: 10.1177/21925682 17701914

Arah, O.A *et al.* (2006) 'A conceptual framework for the OECD Health Care Quality Indicators Project', *International Journal for Quality in Health Care*, 18(1), pp. 5–13. doi: 10.1093/intqhc/mzl024

Arjun, S. *et al.* (2017) 'National Database Research in Spine Surgery: Limitations in the Current Literature', *Clinical Spine Surgery*, 30(1), pp. 27-9. doi: 10.1097/BSD.0000000000000496

Ashauer-Walner, S. *et al.* (2017) 'The Austrian Spinal Cord Injury Study: a registry for patients living with a traumatic spinal cord injury', *Spinal Cord Series and Cases*, 3, 17076. doi: 10.1038/s41394-017-0006-y

Asher, A.L. *et al.* (2020) 'Quality Outcomes Database Spine Care Project 2012-2020: milestones achieved in a collaborative North American outcomes registry to advance value-based spine care and evolution to the American Spine Registry', *Neurosurgical Focus*, 48(5): E2. doi: 10.3171/2020.2.FOCUS207

Australian Council for Safety and Quality in Health Care (2006) *Definition of quality of health care*. Australian Government. Available at: <http://www.safetyandquality.org/definition/smsequential.htm> (Accessed: 2 May 2025)

Australian Spine Registry (2015) Available at: <https://www.spineregistry.org.au/> (Accessed: 6 May 2025)

Belgian Health Care Knowledge Centre (2017) *KCE Report 287 Good clinical practice: Low back pain and radicular pain: assessment and management*. Brussels: Belgian Health Care Knowledge Centre. Available at: https://kce.fgov.be/sites/default/files/2021-11/KCE_287_Low_back_pain_Report.pdf (Accessed: 3 August 2025)

Belgian Health Care Knowledge Centre (2024) *Performance of the Belgian Health System: Report 2024*. Brussels: KCE. Available at: https://kce.fgov.be/sites/default/files/2024-01/KCE376C_HSPA2024_Report.pdf (Accessed: 21 May 2025)

Bennet, C. *et al.* (2018) 'What Is the State of Quality Measurement in Spine Surgery?', *Clinical Orthopaedics and Related Research*, 476(4), pp. 725-31. doi: 10.1007/s11999-00000000000000074

Benzel, E.C. (2012) *Spine Surgery: Techniques, Complication Avoidance and Management*. 1st Edition. Saunders. (Accessed: 24 May 2025)

Brazilian Association of Physical Medicine and Rehabilitation (2013) 'Chronic nonspecific low back pain: Rehabilitation', *Revista da Associacao Medica Brasileira*, 59(6), pp. 536-53. doi: 10.1016/j.ramb.2013.10.003

British Spine Registry (2012) Available at: <https://www.britishspineregistry.com/> (Accessed: 4 May 2025)

Brouwers, M.C. *et al.* (2010) 'Development of the AGREE II, part 2: assessment of validity of items and tools to support application', *Canadian Medical Association Journal*, 182(10), pp. 472-8. doi: 10.1503/cmaj.091716

Brouwers, M.C. *et al.* (2020) 'Development and validation of a tool to assess the quality of clinical practice guideline recommendations', *JAMA Network Open*, 3(5), e205535. doi: 10.1001/jamanetworkopen.2020.5535

Campbell, S.M. *et al.* (2002) 'Research methods used in developing and applying quality indicators in primary care', *Quality and Safety in Health Care*, 11(4), pp. 358-64. doi: 10.1136/qhc.11.4.358

Canadian Chiropractic Research Foundation (2021) 'Non-surgical interventions for lumbar spinal stenosis leading to neurogenic claudication: a clinical practice guideline', *The Journal of Pain*, 22(9), pp. 1015-39. doi: 10.1016/j.jpain.2021.03.147

Carbonell, C. *et al.* (2024) 'Barriers and challenges to implementing a quality improvement program: political and administrative challenges', *Global Oncology*, 10. doi: 10.1200/GO.23.00455

Chinese Association of Integrative Medicine, Chinese Society of Traditional Chinese Medicine, Chinese Medical Association (2024) 'Guidelines for the diagnosis and treatment of lumbar spinal stenosis with integrated traditional Chinese medicine and Western medicine', *Chinese General Practice*, 27(5), pp. 3076-82. doi: 10.12114/j.issn.1007-9572.2024.0053

Congress of Neurological Surgeons (2021a) 'Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative opioid evaluation', *Neurosurgery*, 89(1), S1-S8. doi: 10.1093/neuros/nyab315

Congress of Neurological Surgeons (2021b) 'Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative osteoporosis assessment', *Neurosurgery*, 89(1), S19-S25. doi: 10.1093/neuros/nyab317

Cohen, M. *et al.* (2016) 'Improved surgical outcomes for ACS NSQIP hospitals over time', *Annals of Surgery*, 263(2), pp. 267-73. doi: 10.1097/SLA.0000000000001192

Czech Republic; Kaiser R. *et al.* (2023) 'Surgical treatment of degenerative lumbar stenosis and spondylolisthesis: Clinical practice guideline', *Acta Chirurgiae Orthopaedicae*, 90(3), pp. 157-67.

DaneSpine (2009) Available at: <https://drks.ortopaedi.dk/om-danespine/> (Accessed: 4 May 2025)

Danish Health Authority (2017) 'National clinical guidelines for non-surgical treatment of patients with recent onset neck pain or cervical radiculopathy', *European Spine Journal*, 26(9), pp. 2242-57. doi: 10.1007/s00586-017-5121-8

Danish Health Authority (2019) 'Danish national clinical guidelines for surgical and nonsurgical treatment of patients with lumbar spinal stenosis', *European Spine Journal*, 28(6), pp. 1386-96. doi: 10.1007/s00586-019-05987-2

Danish Regions (2018) *National Goals of the Danish Healthcare System 2018*. Copenhagen: Danish Regions. Available at: <https://www.ism.dk/Media/E/D/national-goals-of-the-danish-healthcare-system-2018.pdf> (Accessed: 21 May 2025)

Davies, B.M. *et al.* (2019) 'RE-CODE DCM (RE search Objectives and Common Data Elements for Degenerative Cervical Myelopathy): A Consensus Process to Improve Research Efficiency in DCM, Through Establishment of a Standardized Dataset for Clinical Research and the Definition of the Research Priorities', *Global Spine Journal*, 9(1), pp. 65-76. doi: 10.1177/2192568219832855

Deckert, S. *et al.* (2019) '(How) Are quality indicators for measuring and appraising the quality of healthcare derived from evidence-based clinical practice guidelines? A review', *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen*, 147: 45-57. doi: 10.1016/j.zefq.2019.09.002

De Koning, J.S. *et al.* (2007) 'Quality indicators: development and evaluation of a new instrument', *International Journal for Quality in Health Care*, 19(5), pp. 306-13. doi: 10.1093/intqhc/mzm031

Department of Health and Social Care (2015) *The NHS Constitution for England*. National Health Service. Available at: <https://www.gov.uk/government/publications/the-nhs-constitution-for-england/the-nhs-constitution-for-england> (Accessed: 1 May 2025)

Department of Veterans Affairs & Department of Defence (2019) 'VA/DoD clinical practice guideline: Diagnosis and treatment of low back pain', *Journal of General Internal Medicine*, 34(11), pp. 2620-9. doi: 10.1007/s11606-019-05086-4

Dietz, N. *et al.* (2018) 'Variability in the utility of predictive models in predicting patient-reported outcomes following spine surgery for degenerative conditions: a systematic review', *Neurosurgical Focus*, 45(5), pp. E10. doi: 10.3171/2018.8.FOCUS18331

Dijkers, M.P. *et al.* (2020) 'Quality of Rehabilitation Clinical Practice Guidelines: An Overview Study of AGREE II Appraisals', *Archives of Physical Medicine and Rehabilitation*, 101(9), pp. 1643-55. doi: 10.1016/j.apmr.2020.03.022

Donabedian, A. (1988) 'The quality of care: How can it be assessed?', *JAMA*, 260(12), pp. 1743-1748. doi: 10.1001/jama.1988.03410120089033

Dutch Organisation for Occupational Physicians, Dutch Organisation for Physicians in Social Insurance Medicine & Dutch Organisation for Medical Officers in Private Insurances (2021) 'The Dutch

multidisciplinary occupational health guideline to enhance work participation among low back pain and lumbosacral radicular syndrome patients', *Journal of Occupational Rehabilitation*, 32(3), pp. 337-52. doi: 10.1007/s10926-021-09993-4

Dutch Orthopaedic Association (2020) *Guideline: Instrumented spine surgery*. Richtlijnendatabase. Available at: https://richtlijnendatabase.nl/richtlijn/geinstrumenteerde_spinaalchirurgie/startpagina_spinaalchirurgie.html (Accessed: 4 August 2025)

Dutch Spine Surgery Registry (2014) Available at: <https://bronnen.zorggegevens.nl/Bron?naam=Dutch-Spine-Surgery-Registry> (Accessed: 4 May 2025)

Ecuadorian Ministry of Public Health (2016) *Low back pain – Clinical practice guideline*. First Edition. Quito: National Directorate of Standardization. Available at: <http://salud.gob.ec> (Accessed: 5 August 2025)

Enhanced Recovery After Surgery Society (2021) 'Consensus statement for perioperative care in lumbar spinal fusion: Enhanced Recovery After Surgery (ERAS) Society recommendations', *The Spine Journal*, 21(5), pp. 729-52. doi: 10.1016/j.spinee.2021.01.001

European Society of Anaesthesiology (2018) 'European guidelines on perioperative venous thromboembolism prophylaxis: neurosurgery', *European Journal of Anaesthesiology*, 35(2), pp. 90-5. doi: 10.1097/EJA.0000000000000710

European Spine Deformity Study Group (2017) 'Advantages and Disadvantages of Adult Spinal Deformity Surgery and Its Impact on Health-Related Quality of Life', *Spine*, 42(6), pp. 411-9. doi: 10.1097/BRS.0000000000001770

Fekete, T.F. *et al.* (2016) 'What level of pain are patients happy to live with after surgery for lumbar degenerative disorders?', *The Spine Journal*, 16(4), pp. S12-8. doi: 10.1016/j.spinee.2016.01.180

Finnish Spine Register (2016) Available at: <https://thl.fi/en/statistics-and-data/data-and-services/register-descriptions/finnish-spine-register-national-quality-register-> (Accessed: 4 May 2025)

Florez, I.D. *et al.* (2020) 'Assessment of the quality of recommendations from 161 clinical practice guidelines using the Appraisal of Guidelines for Research and Evaluation–Recommendations Excellence (AGREE-REX) instrument shows there is room for improvement', *Implementation Science*, 15:79. doi: 10.1186/s13012-020-01036-5

French Society of Physical Medicine and Rehabilitation (2021) 'Rehabilitation and lumbar surgery: the French recommendations for clinical practice', *Annals of Physical and Rehabilitation Medicine*, 64(6), 101548. doi: 10.1016/j.rehab.2021.101548

Frymoyer, J.W. (1993) 'An international challenge to the diagnosis and treatment of disorders of the lumbar spine', *Spine*, 18(15), pp. 2147-52

German spine society (2018) *German S2k guideline, Lumbar radiculopathy guidelines for diagnostics and therapy in neurology*. Deutsche Gesellschaft für Neurologie. Available at: <https://www.dgn.org/leitlinie/lumbale-radikulopathie-3c0f86e3-ab50-40a7-acb9-cc29473dd217> (Accessed: 3 August 2025)

German spine society (2020) *German spine society S2K guideline on conservative, surgical, and rehabilitative management of disc herniation with radicular symptoms*. Deutsche Gesellschaft für Neurologie. Available at: https://register.awmf.org/assets/guidelines/033-048l_S2k_Konservative-operative-rehabilitative-Versorgung-Bandscheibenvorfall-radikulae_2025-09-abgelaufen.pdf (Accessed: 3 August 2025)

German Spine Society (2024) *German Spine Society S2k guideline, specific low back pain*. Deutsche Gesellschaft für Neurologie. Available at: [187-059l_S2k_Spezifischer-Kreuzschmerz_2024-08.pdf](https://register.awmf.org/assets/guidelines/187-059l_S2k_Spezifischer-Kreuzschmerz_2024-08.pdf) (Accessed: 3 August 2025)

German Spine Society (2025) *German Spine Society S3 guideline, epidural injections in degenerative spinal disorders*. Deutsche Gesellschaft für Neurologie. Available at: <https://pubmed.ncbi.nlm.nih.gov/40760167/> (Accessed: 3 August 2025)

Ghasemi, A. and Zahedias, S. (2012) 'Normality Tests for Statistical Analysis: A Guide for Non-Statisticians', *International Journal of Endocrinology and Metabolism*, 10(2), pp. 486-9. doi: 10.5812/ijem.3505

Globus Medical (2025) *SpineTRACK: A Collaborative Spine Outcomes Database*. Audubon, Pennsylvania. Available at: https://www.globusmedical.com/wp-content/uploads/2025/05/GMBR-C373-SpineTRACK-Registry-Surgeon-Brochure-Rev-A.pdf?utm_source=chatgpt.com (Accessed: 24 May 2025)

Guyatt, G.H. *et al.* (2008) 'GRADE: an emerging consensus on rating quality of evidence and strength of recommendations', *BMJ*, 336(7650), pp. 924-6. doi: 10.1136/bmj.39489.470347.AD

Haute Autorité de Santé (2024) *Améliorer la qualité en santé: rapport d'analyse prospective*. Saint-Denis La Plaine: HAS. Available at: https://www.has-sante.fr/jcms/p_3546249/fr/ameliorer-la-qualite-en-sante-rapport-d-analyse-prospective-has-2024 (Accessed: 21 May 2025)

Hartvigsen, J. *et al.* (2018) 'What low back pain is and why we need to pay attention', *The Lancet*, 39, pp. 2356-67. doi: 10.1016/S0140-6736(18)30480-X

Higgins J.P.T. *et al.* (2024) *Cochrane Handbook for Systematic Reviews of Interventions version 6.5*. Cochrane. Available at: www.cochrane.org/handbook (Accessed: 1 July 2025)

Institute for Quality Assurance and Transparency in Health Care (2024) *Methodische Grundlagen*. IQTIG. Available at: https://iqtig.org/downloads/berichte/2024/IQTIG_Methodische-Grundlagen_Version-2.1_2024-11-27.pdf (Accessed: 21 May 2025)

Institute of Medicine (2001) *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press. Available at: <https://nap.nationalacademies.org/catalog/10027/crossing-the-quality-chasm-a-new-health-system-for-the> (Accessed: 1 May 2025)

Institute of Medicine (2011) *Clinical Practice Guidelines We Can Trust*. Washington, DC: The National Academies Press. Available at: <https://nap.nationalacademies.org/catalog/13058/clinical-practice-guidelines-we-can-trust> (Accessed: 2 September 2025)

Iranian National Spinal Cord Injury Registry (2014) Available at: <http://www.traumasina.ir/en/2020/12/06/national-spinal-cord-injury-registry-of-iran/> (Accessed: 4 May 2025)

Italian Society of Spinal Surgery (2008) *Appropriateness of diagnosis and surgical treatment of symptomatic lumbar disc herniation*. Isico. Available at: <https://www.isico.it/wp-content/uploads/2022/05/ernia-sdl.pdf> (Accessed: 3 August 2025)

Italian Spine Registry (2017) Available at: <https://ripi.iss.it/ripi/en/the-project/ridis-italian-spine-registry/> (Accessed: 4 May 2025)

Jamieson, S. (2004) 'Likert scales: how to (ab)use them', *Medical Education*, 38(12), pp. 1217-8. doi: 10.1111/j.1365-2929.2004.02012.x

Japanese Orthopaedic Association (2021) 'Japanese Orthopaedic Association (JOA) clinical practice guidelines on the management of lumbar spinal stenosis, 2021 - Secondary publication', *Journal of Orthopaedic Science*, 28(1), pp. 46-91. doi: 10.1016/j.jos.2022.03.013

Japanese Spinal Instrumentation Society Database (2018) Available at: <https://jsisdb.org/> (Accessed: 7 May 2025)

Jiang, F. *et al.* (2020) 'Quality and safety improvement in spine surgery', *Global Spine Journal*, 10(1), pp. 17S-28S. doi: 10.1177/2192568219839699

Kobayashi, K. *et al.* (2022) 'Trends in the numbers of spine surgeries and spine surgeons over the past 15 years', *Nagoya Journal of Medical Science*, 84(1), pp. 155-62. doi: 10.18999/nagjms.84.1.155

Korean Acupuncture and Moxibustion Medicine Society, Society of Korean Medicine Rehabilitation, Association of the Spine and Joint Korean Medicine (2022) 'Korean medicine clinical practice guidelines for lumbar herniated intervertebral disc in adults: based on grading of recommendations assessment, development and evaluation', *Healthcare*, 10(2), 216. doi: 10.3390/healthcare10020246

Korean Pain Society, Korean Spinal Pain Society, Korean Spinal Neurosurgery Society (2025) 'Evidence-based clinical practice guidelines for patients with lumbar disc herniation with radiculopathy in South Korea', *Neurospine*, 22(2), pp. 366-83. doi: 10.14245/ns.2550094.047

Langendam, M.W. *et al.* (2020) 'Approaches of integrating the development of guidelines and quality indicators: a systematic review', *BMC Health Services Research*, 20:875. doi: 10.1186/s12913-020-05665-w

Lee, M.J. *et al.* (2015) 'The spine surgical care and outcomes assessment program (Spine SCOAP): a surgeon-led approach to quality and safety', *Spine*, 40(5), pp. 332-41. doi: 10.1097/BRS.0000000000000750

Lenzer, J. (2013) 'Why we can't trust clinical guidelines', *BMJ*, 14(346), pp. f3830. doi: 10.1136/bmj.f3830

Li, Y. *et al.* (2024) 'Global burden of low back pain and its attributable risk factors from 1990 to 2021: a comprehensive analysis from the global burden of disease study 2021', *Frontiers in Public Health*, 12. doi: 10.3389/fpubh.2024.1480779

Lim, T.H. *et al.* (2024) 'Nonpharmacological Spine Pain Management in Clinical Practice Guidelines: A Systematic Review Using AGREE II and AGREE-REX Tools', *Journal of Orthopaedic and Sports Physical Therapy*, 55(1), pp. 12-25. doi: 10.2519/jospt.2024.12729

Lumbar Spinal Stenosis Consensus Group (2018) 'The MIST guidelines: The lumbar spinal stenosis consensus group guidelines for Minimally Invasive Spine Treatment', *Pain Practice*, 19(3), pp. 250-74. doi: 10.1111/papr.12744

Mainz, J. (2003) 'Defining and classifying clinical indicators for quality improvement', *International Journal for Quality in Health Care*, 15(6), pp. 523-30. doi: 10.1093/intqhc/mzg081

Mant, J. (2001) 'Process versus outcome indicators in the assessment of quality of health care', *International Journal for Quality in Health Care*, 13(6), pp. 475-80. doi: 10.1093/intqhc/13.6.475

McIntosh, G. *et al.* (2020) 'Development and Implementation of a National Canadian Spine Surgery Registry', *Journal of Current Clinical Care*, 10(2), pp. 21-31

McNeil, B.J. *et al.* (2001) 'Hidden barriers to improvement in the quality of care', *The New England Journal of Medicine*, 345(22), pp. 1612-20. doi: 10.1056/NEJMsa011810

Meyer, B. *et al.* (2020) 'Completeness and accuracy of data in spine registries: an independent audit-based study', *European Spine Journal*, 29, pp. 1453–1461. doi: 10.1007/s00586-020-06342-6

Ministério da Saúde (2023) *Second Monitoring and Evaluation Report on Digital Health*. Brasília: Ministério da Saúde. Available at: https://bvsms.saude.gov.br/bvs/publicacoes/2nd_monitoring_evaluation_report_digital_health.pdf (Accessed: 21 May 2025)

Ministry of Health (2015) *Wet van 7 oktober 2015, houdende regels ter bevordering van de kwaliteit van zorg en de behandeling van klachten en geschillen in de zorg*. Government of The Netherlands. Available at: <https://wetten.overheid.nl/BWBR0037173/> (Accessed: 1 May 2025)

Ministry of Health (2016). *Ghana National Healthcare Quality Strategy (2017–2021)*. Government of Ghana. Available at: <https://www.moh.gov.gh/wp-content/uploads/2017/06/National20Quality20Strategy20Ghana.pdf> (Accessed: 2 May 2025)

Ministry of Health (2022) *Regulation No. 30 of 2022 on Hospital Service Quality*. Republic of Indonesia. Available at: <https://peraturan.bpk.go.id/Home/Details/200201/permenkes-no-30-tahun-2022> (Accessed: 2 May 2025)

Ministry of Health (2022) *National Policy for Quality in Healthcare 2022–2026*. Government of Malaysia. Available at: https://galeri.nih.gov.my/mini2/images/resources/qa-qj/5.%20NPQH_full_version_12.3.2022.pdf (Accessed: 2 May 2025)

Ministry of Health (2021) *National Quality Improvement Framework and Strategic Plan 2021–2025*. Government of Uganda. Available at: <https://library.health.go.ug/file-download/download/public/1527> (Accessed: 2 May 2025)

Ministry of Health and Family Welfare (2017) *National Health Policy*. Government of India. Available at: <https://mohfw.gov.in/sites/default/files/9147562941489753121.pdf> (Accessed: 2 May 2025)

Ministry of Health and Social Protection (2023) *Second Monitoring and Evaluation Report on Digital Health*. Bogotá: Ministry of Health and Social Protection. Available at: https://bvsms.saude.gov.br/bvs/publicacoes/2nd_monitoring_evaluation_report_digital_health.pdf (Accessed: 21 May 2025)

Ministry of National Health Services, Regulations & Coordination (2016) *National Health Vision Pakistan 2016–2025*. Government of Pakistan. Available at: <https://phkh.nhsrpk.gov.pk/sites/default/files/2020-2/National%20Health%20Vision%20Pakistan%202016-2025.pdf> (Accessed: 2 May 2025)

Ministry of Social Affairs and Health (2025) *Client and patient rights*. Government of Finland. Available at: <https://stm.fi/en/client-and-patient-rights> (Accessed: 21 May 2025)

National Board of Health and Welfare (2020) *National Action Plan for Increased Patient Safety in Swedish Health Care 2020–2024*. Government of Sweden. Available at: <https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/artikelkatalog/ovrigt/2020-1-6564-english.pdf> (Accessed: 1 May 2025)

National Health Service (2008) *High quality care for all: NHS Next Stage Review final report*. London: The Stationery Office. Available at: <https://assets.publishing.service.gov.uk/media/5a7c3a5b40f0b67d0b11fbaf/7432.pdf> (Accessed: 1 May 2025)

National Institute for Health and Care Excellence (2019) *NICE Indicator Process Guide*. NICE England. Available at: <https://www.nice.org.uk/process/pmg44/resources/nice-indicator-process-guide-pdf-72286836351685> (Accessed: 20 May 2025)

National Institute for Health and Care Excellence (2020) *Low back pain and sciatica in over 16s: assessment and management – NICE guideline*. London: NICE. Available at: <https://www.nice.org.uk/guidance/ng59> (Accessed: 27 July 2025)

National Institute for Health and Disability Insurance (2023) *Registratie- en overdrachtsmodaliteiten voor de verstrekkingen betreffende de chirurgische ingrepen op het niveau van de wervelkolom*. NIHDI Belgium. Available at: https://www.inami.fgov.be/SiteCollectionDocuments/medische_verstrekking_en_medische_hulpmiddelen_modaliteiten_ortho_trauma_03.pdf (Accessed: 4 July 2025)

National People's Congress (2019) *Basic Healthcare and Health Promotion Law of the People's Republic of China*. Government of China. Available at: https://en.moj.gov.cn/2021-06/26/c_636455.htm (Accessed: 2 May 2025)

National Quality Forum (2012) *Measure Evaluation Criteria*. NQF. Available at: https://www.qualityforum.org/Measuring_Performance/Submitting_Standards/Measure_Evaluation_Criteria.aspx?utm_source=chatgpt.com (Accessed: 24 May 2025)

New Zealand Spinal Cord Injury Registry (2016) Available at: <https://nzspinaltrust.org.nz/i-need-information/new-zealand-spinal-cord-injury-registry-nzscir/new-zealand-spinal-cord-injury-registry-nzscir/> (Accessed: 4 May 2025)

Noonan, V.K. (2023) 'A Look at Spinal Cord Injury in Canada: Rick Hansen Spinal Cord Injury Registry (RHSCIR) - 2021 SCI Data Summary', *Topics in Spinal Cord Injury Rehabilitation*, 29, pp. 165-70. doi: 10.46292/sci23-00031S

Norman, G. (2010) 'Likert scales, levels of measurement and the "laws" of statistics', *Advances in Health Sciences Education*, 15(5), pp. 625–632. doi:10.1007/s10459-010-9222-y

North American Spine Society (2009) 'An evidence-based clinical guideline for the use of antithrombotic therapies in spine surgery', *The Spine Journal*, 9(12), pp. 1046-51. doi: 10.1016/j.spinee.2009.09.005

North American Spine Society (2011) 'An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders', *The Spine Journal*, 11(1), pp. 64-72. doi: 10.1016/j.spinee.2010.10.023

North American Spine Society (2013a) 'An evidence-based clinical guideline for the diagnosis and treatment of degenerative lumbar spinal stenosis', *The Spine Journal*, 13(7), pp. 734-43. doi: 10.1016/j.spinee.2012.11.059

North American Spine Society (2013b) 'An evidence-based clinical guideline for antibiotic prophylaxis in spine surgery', *The Spine Journal*, 13(10), pp. 1387-92. doi: 10.1016/j.spinee.2013.06.030

North American Spine Society (2014) 'Evidence-based clinical guidelines for multidisciplinary spine care: diagnosis and treatment of degenerative lumbar spondylolisthesis', *The Spine Journal*, 16(3), pp. 439-48. doi: 10.1016/j.spinee.2015.11.055

Norwegian Registry for Spine Surgery (2007) Available at: <https://helsedata.no/en/forvaltere/university-hospital-of-north-norway/norwegian-registry-for-spine-surgery/> (Accessed: 4 May 2025)

Norwegian Directorate of Health (2022) *National Healthcare Quality Indicators*. Government of Norway. Available at: <https://www.helsedirektoratet.no/english/national-health-care-quality-indicators> (Accessed: 1 May 2025)

Page, M.J. *et al.* (2021) 'The PRISMA 2020 statement: an updated guideline for reporting systematic reviews', *British Medical Journal*, 372: n71. doi: 10.1136/bmj.n71

Pascucci, S. *et al.* (2023) 'National spine surgery registries' characteristics and aims: globally accepted standards have yet to be met. Results of a scoping review and a complementary survey', *Journal of Orthopaedics and Traumatology*, 24(9). doi: 10.1186/s10195-023-00732-4

Pediatric Spine Foundation (2020) *Pediatric Spine Study Group Registry*. Pennsylvania. Available at: <https://pediatricspinefoundation.org/> (Accessed: 2 May 2025)

Peruvian Ministry of Public Health (2016) *Clinical practice guideline for the diagnosis and treatment of low back pain. Short version guideline*. Peru. Available at: <https://www.essalud.gob.pe/ietsi/pdfs/gui>

as/1_GPC_diagnostico_y_tratamiento_de_lumbalgia_version_corta.pdf (Accessed: 2 September 2025)

Porter, M.E. (2010) 'What is value in health care?', *The New England Journal of Medicine*, 363(26). doi: 10.1056/NEJMp1011024

Public Health Agency of Canada (2000) *Quest for Quality in Canadian Health Care. Continuous Quality Improvement*. Ottawa: Health Canada. Available at: https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2000-qual/quest-quete-eng.pdf (Accessed: 2 May 2025)

Ravindra, V.M. *et al.* (2018) 'Degenerative Lumbar Spine Disease: Estimating Global Incidence and Worldwide Volume', *Global Spine Journal*, 8(8), pp. 784-94. doi: 10.1177/2192568218770769

Reisener, M.J. *et al.* (2020) 'Trends in lumbar spinal fusion—a literature review', *Journal of Spine Surgery*, 6(4). doi: 10.21037/jss-20-492

Resnick, D.K. (2023) 'Quality and outcomes in spine surgery', *International Journal of Spine Surgery*, 17(2), pp. 166-7. doi: 10.14444/8433

Röder, C. *et al.* (2002) 'A European Spine Register', *European Spine Journal*, 11(4), pp. 303-7. doi: 10.1007/s00586-002-0453-3

Royal Dutch Society for Physical Therapy (2024) 'Management of low back pain and lumbosacral radicular syndrome: the guideline of the Royal Dutch Society for Physical Therapy', *European Journal of Physical and Rehabilitation Medicine*, 60(2), pp. 292-318. doi: 10.23736/S1973-9087.24.08352-7

Sastry, R.A. *et al.* (2023) 'Patterns in decompression and fusion procedures for patients with lumbar stenosis after major clinical trial results, 2016 to 2019', *Journal of the American Medical Association*, 6(7). doi: 10.1001/jamanetworkopen.2023.26357

Sansur, C.A. *et al.* (2011). 'Scoliosis research society morbidity and mortality of adult scoliosis surgery', *Spine*, 36(9). pp. 593-7. doi: 10.1097/brs.0b013e3182059bfd

Shekelle, P.G. *et al.* (1999). 'Developing clinical guidelines', *Western Journal of Medicine*, 170(6), pp. 348–351. doi: 10.1136/bmj.318.7183.593

Spinal Surgery Group of the Chinese Orthopaedic Association (2015) 'Clinical guideline for treatment of symptomatic thoracic spinal stenosis', *Orthopaedic Surgery*, 7(3), pp. 208-12. doi: 10.1111/os.12190

St. Olavs University Hospital (2013) *A common SCI Medical Quality Registry for the Nordic Countries, the challenges and opportunities*. Nordic Spinal Cord Injury Registry. Available at: <https://www>.

stolav.no/4a8e7d/siteassets/seksjon/nordicscir/documents/postere/a-common-sci-medical-quality-registry-for-the-nordic-countries.pdf (Accessed: 2 May 2025)

St. Pierre, G.H. *et al.* (2018) 'Performance Indicators in Spine Surgery', *Spine*, 43(4), pp. 275-80, doi: 10.1097/BRS.0000000000002309

Swedish Spine Registry (1998) Available at: <https://www.swespine.se/page.aspx?id=1> (Accessed: 4 May 2025)

Swiss National Implant Registry, Spine (2007) Available at: <https://www.siris-implant.ch/en/Fachinformation/SIRIS-Spine> (Accessed: 4 May 2025)

The Norwegian Communication Unit for Musculoskeletal Disorders (2006) 'National clinical guidelines: Low back pain – with and without nerve root involvement', *Tidsskrift for den Norske laegeforening*, 127(20), 2706

The Polish Society of Spinal Surgery (2016a) 'Treatment of degenerative cervical spondylosis with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery', *Neurologia I Neurochirurgia Polska*, 50(2), pp. 109-13. doi: 10.1016/j.pjnns.2015.12.002

The Polish Society of Spinal Surgery (2016b) 'Treatment of lumbar disc herniation with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery', *Neurologia I Neurochirurgia Polska*, 50(2), pp. 101-8. doi: 10.1016/j.pjnns.2015.12.001

Torre, M. *et al.* (2025) 'Time trends in spine surgery in Italy: a nationwide, population-based study of 1,560,969 records of administrative health data from 2001 to 2019', *Acta Orthopaedica*, 96. doi: 10.2340/17453674.2025.43188

United Kingdom National Spinal Cord Injury Database (2013) Available at: <https://www.nscisb.nhs.uk/> (Accessed: 5 May 2025)

Utku, S. (2020) 'Spine Surgery Database: Spine Disease Analytical Evaluation Module', *Turkish Neurosurgery*, 31(2), pp. 182-8. doi: 10.5137/1019-5149.JTN.28328-19.1

Vinas-Rios, J.M. *et al.* (2020) 'The degree of invasiveness has no influence on the rate of incidental durotomies in surgery for lumbar spinal canal stenosis: data from the German spine registry', *Journal of Neurosurgical Sciences*, 64(6), pp. 499-501. doi: 10.23736/S0390-5616.18.04381-3

Vos, T. *et al.* (2020) 'Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019', *The Lancet*, 396(10258), pp. 1204-22. doi: 10.1016/S0140-6736(20)30925-9

Winebrake, J.P. *et al.* (2019) 'Wide Variability in Patient-Reported Outcomes Measures After Fusion for Lumbar Spinal Stenosis: A Systematic Review', *Global Spine Journal*, 10(2), pp. 209-15. doi: 10.1177/2192568219832853

Working group on guidelines for chronic low back pain (2006a) 'European guidelines for the management of chronic nonspecific low back pain', *European Spine Journal*, 15(2), pp. S192-300. doi: 10.1007/s00586-006-1072-1

Working group on guidelines for the management of acute low back pain in primary care (2006b) 'European guidelines for the management of acute nonspecific low back pain in primary care', *European Spine Journal*, 15(2), pp. S169-91. doi: 10.1007/s00586-006-1071-2

World Federation of Neurosurgical Societies Spine Committee (2019a) 'Cervical spondylotic myelopathy: natural course and the value of diagnostic techniques - WFNS spine committee recommendations', *Neurospine*, 16(3), pp. 386-402. doi: 10.14245/ns.1938240.120

World Federation of Neurosurgical Societies (2019b) 'Anterior surgical techniques for cervical spondylotic myelopathy: WFNS Spine Committee Recommendations', *Neurospine*, 16(3), pp. 408-20. doi: 10.14245/ns.1938250.125

World Federation of Neurosurgical Societies Spine Committee (2020a) 'Natural course and diagnosis of lumbar spinal stenosis: WFNS spine committee recommendations', *World Neurosurgery X*, 28(7), 100073. doi: 10.1016/j.wnsx.2020.100073

World Federation of Neurosurgical Societies (2020b) 'Fusion surgery for lumbar spinal stenosis: WFNS spine committee recommendations', *World Neurosurgery X*, 18(7), 100077. doi: 10.1016/j.wnsx.2020.100077

World Federation of Neurosurgical Societies (2020c) 'Mobility-preserving surgery for lumbar spinal stenosis: WFNS Spine Committee Recommendations', *World Neurosurgery X*, 19(7), 100078. doi: 10.1016/j.wnsx.2020.100078

World Federation of Neurosurgical Societies (2024a) 'Lumbar disc herniation: Prevention and treatment of recurrence: WFNS spine committee recommendations', *World Neurosurgery X*, 9(22), 100275. doi: 10.1016/j.wnsx.2024.100275

World Federation of Neurosurgical Societies (2024b) 'Role of surgery in primary lumbar disk herniation: WFNS spine committee recommendations', *World Neurosurgery X*, 23(22), 100276. doi: 10.1016/j.wnsx.2024.100276

World Health Organisation (2006) *Quality of care: a process for making strategic choices in health systems*. Geneva: World Health Organisation. Available at: https://iris.who.int/bitstream/handle/10665/43470/9241563249_eng.pdf?sequence=1&isAllowed=y (Accessed: 1 May 2025)

World Health Organisation (2014) *WHO Handbook for Guideline Development*. 2nd ed. Geneva: World Health Organization. Available at: <https://www.who.int/publications/i/item/9789241548960> (Accessed: 3 September 2025)

World Health Organisation (2019) *International Classification of Diseases 11th Revision (ICD-11)*. Geneva: World Health Organisation. Available at: <https://icd.who.int/en> (Accessed: 3 July 2025)

World Health Organisation (2023) *WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings*. Geneva. Available at: <https://www.who.int/publications/i/item/9789240081789> (Accessed: 3 August 2025)

Wu, A. *et al.* (2020) 'Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017', *Annals of Translational Medicine*, 8(6). doi: 10.21037/atm.2020.02.175

Yoshihara, H. and Yoneoka, D. (2015) 'National trends in the surgical treatment for lumbar degenerative disc disease: United States, 2000 to 2009', *The Spine Journal*, 15(2), pp. 265-71. doi: 10.1016/j.spinee.2014.09.026

Appendices

Appendix 1 Non-exhaustive list of national institutional definitions of 'healthcare quality'

International	World Health Organisation, 2006
	The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.
North America	Canada (Public Health Agency of Canada, 2000)
	The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.
	United States of America (Agency for Healthcare Research and Quality, 2016)
South America	United States of America (Institute of Medicine, 2001)
	Quality healthcare means doing the right thing, at the right time, in the right way, for the right person – and having the best possible results.
	Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. (Six domains are defined, describing what high-quality care should aim to achieve: safe, effective, patient-centred, timely, efficient and equitable care)
Europe	Brazil (Ministry of Health, 2023) ¹
	The quality of healthcare is understood as the set of characteristics of care that ensures users timely, safe, effective, efficient, equitable and person-centred access, based on scientific evidence and respect for users' rights.
	Belgium (Belgian Health Care Knowledge Centre, 2024) ¹
	The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.
	Denmark (Danish Healthcare Quality Programme, 2018) ¹
	Healthcare quality is understood as a continuous effort to improve patient outcomes, reduce unwarranted variation and strengthen trust in the health system, through a shared commitment to national goals, evidence-based practices and patient involvement.

	France (National Health Authority, 2024) ¹	Quality of care is defined as the ability of health services provided to individuals and populations to improve the desired health outcomes.
	Finland (Ministry of Social Affairs and Health, 2025) ¹	High-quality treatment means that you will receive health services according to your need at the right time and in the right place. High quality also means that the services are provided smoothly and efficiently. (Six domains are defined, describing what high-quality care should aim to achieve: client-focused, availability, fairness, freedom of choice, patient safety, effectiveness)
	Norway (Norwegian Directorate of Health, 2022) ¹	Healthcare quality is defined through six dimensions: effective, safe, patient-centred, timely, efficient, and equitable care. A high-quality health service provides good results, uses resources properly and ensures that the service is experienced as meaningful and accessible for the patient.
	Sweden (National Board of Health and Welfare, 2020) ¹	Healthcare of good quality shall be knowledge-based and appropriate, safe, patient-centred, efficient, equitable and provided timely.
	The Netherlands (Ministry of Health, 2015) ¹	Care that is of good quality and of a proper standard, which is in any case safe, effective, efficient, and client-centred, provided in a timely manner and tailored to the client's actual needs; in which care providers act in accordance with their responsibilities arising from the professional standard, including the professional standard applicable to them as listed in the public register of the Health Insurance Act; in which the rights of the client are carefully respected and the client is treated with dignity in all other respects.
	United Kingdom (Department of Health and Social Care, 2015)	High quality care is care that is effective, safe and provides as positive an experience for patients as possible.
Asia and Oceania	Australia (Australian Council for Safety and Quality in Health Care, 2006)	The extent to which a health care service or product produces a desired outcome or outcomes.

China (National People's Congress, 2019)¹

Medical and healthcare institutions shall provide safe, effective, convenient and affordable healthcare services to the public and establish and improve internal quality management systems in accordance with laws and regulations.

India (Ministry of Health and Family Welfare, 2017)

Quality of care is at the core of health services. The policy defines quality as care that is effective, safe and patient-centred and emphasizes equity and timeliness. It prioritizes the need for developing standard treatment guidelines, clinical protocols and measurable indicators of quality to ensure evidence-based practices.

Indonesia (Ministry of Health, 2022)¹

High-quality health services must be accessible, acceptable, safe and continuously improved based on standard protocols and community needs.

Malaysia (Ministry of Health, 2022)¹

High-quality healthcare is safe, timely, effective, equitable, efficient, people-centred and accessible; innovative; responsive to the needs of the people and delivered as a team in a caring and professional manner to improve health outcomes and client experience.

Pakistan (Ministry of National Health Services, Regulations & Coordination, 2016)

Quality of care is defined as health services that are safe, effective, timely, equitable and patient-centered, and that contribute to improved health outcomes in an efficient manner.

Africa

Ghana (Ministry of Health, 2016)

Quality of care is the delivery of services that are safe, effective, timely, efficient, equitable and people-centered, contributing to improved health outcomes and client satisfaction.

Uganda (Ministry of Health, 2021)

Quality healthcare is defined as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge of best practice.

¹Translated from the original language to English with the help of DeepL translator (<https://www.deepl.com/en/translator>).

Appendix 2 List of active national and international spine registries at the beginning of 2025¹

International	European Spine Deformity Study Group (European Spine Societies, 2017)
	Surgical treatments of adult spine deformities: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures and health care provider information.
	Nordic Spinal Cord Injury Registry (St. Olavs University Hospital, 2013) ²
	Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs) and rehabilitation data across Nordic nations (Norway, Denmark, Sweden, Iceland).
	Pediatric Spine Study Group Registry (Pediatric Spine Foundation, 2020)
	Both surgical and non-surgical spinal treatments of pediatric spine deformities: patient demographics, clinical information, treatment details, imaging findings, outcome measures (including PROMs) and health care provider information.
	Research Objectives and Common Data Elements for Degenerative Cervical Myelopathy (AO Spine & Myelopathy.org – Davies <i>et al.</i> , 2019)
	Both surgical and non-surgical spinal treatments of degenerative cervical myelopathy patients: patient demographics, clinical information, treatment details, imaging findings, outcome measures (including PROMs) and health care provider information across Europe, North America and Asia.
	Scoliosis Research Society Morbidity and Mortality Database (Scoliosis Research Society – Sansur <i>et al.</i> , 2011)
	Surgical treatments of spinal deformity: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures and health provider information.
	Spine Tango (Eurospine – Röder <i>et al.</i> , 2002)
	Both surgical and non-surgical spinal treatments: patient demographics, clinical information, treatment details, imaging findings, outcome measures (including PROMs) and health care provider information. Used across multiple countries including standardised modules.

North America	American Spine Registry (American Association of Neurological Surgeons & American Academy of Orthopaedic Surgeons, 2025)	Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.
	Canadian Spine Outcomes and Research Network (Canadian Spine Society – McIntosh <i>et al.</i> , 2020)	Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information in $\pm$ 20 hospitals.
	Neuropoint Quality Outcomes Database Spine Registries (Neuropoint – Asher <i>et al.</i> , 2020)	Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information with longitudinal follow-up.
	Rick Hansen Spinal Cord Injury Registry (Praxis Spinal Cord Institute – Noonan, 2023)	Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs), rehabilitation data and community reintegration.
	SpineTRACK (Globus Medical, 2025)	Both surgical and non-surgical spinal treatments: patient demographics, clinical information, treatment details, imaging findings, outcome measures (including PROMs) and health care provider information.
Europe	Austrian Spinal Cord Injury Study (Austrian Social Insurance for Occupational Risks – Aschauer-Walner, 2017) ²	Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs), rehabilitation data and community reintegration.
	Belgian Spine Registry (National Institute for Health and Disability Insurance, 2023)	Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures and health care provider information.

British Spine Registry (British Association of Spine Surgeons, 2012)

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.

Danish Spine Registry (Danish Society of Spinal Surgery, 2009)²

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information with follow-up at 1 year.

Dutch Spine Surgery Registry (Dutch Spine Society, 2014)²

Surgical treatments: patient demographics, clinical information, treatment details, complications and health care provider information.

Finnish Spine Register (Finnish Institute for Health and Welfare, 2016)²

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.

German Spine Registry (German Spine Society – Vinas-Rios *et al.*, 2020)²

Surgical treatments: anonymous patient data, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.

Italian Spine Registry (Italian Implantable Prostheses Registry, 2017)

Surgical treatments: anonymous patient data, clinical information, treatment details, perioperative care, complications, outcome measures and health care provider information.

Norwegian Registry for Spine Surgery (University Hospital of North Norway, 2007)²

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information with follow-up at 3 and 12 months.

Swedish Spine Registry (Swedish Society of Spinal Surgeons, 1998)²

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information with follow-up at 1 and 2 years.

Swiss National Implant Registry (University of Bern, Foundation for Quality Assurance in Implant Surgery, National Association for Quality Development in Hospitals and Clinics, Swiss Orthopaedics & Swiss Medtech, 2007)²

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.

United Kingdom National Spinal Cord Injury Database (National Health Service, 2013)

Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs), rehabilitation data and community integration.

Asia and
Oceania

Australian Spine Registry (Spine Society of Australia & Monash University's School of Public Health and Preventive Medicine, 2015)

Surgical treatments: patient demographics, clinical information, treatment details, perioperative care, complications, outcome measures (including PROMs) and health care provider information.

National Spinal Cord Injury Registry of Iran (Ministry of Health and Medical Education & Sina Trauma and Surgery Research Centre, 2014)²

Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs), rehabilitation data and community integration.

Japanese Spinal Instrumentation Society Database (Japanese Spinal Instrumentation Society, 2018)²

Surgical treatments: patient demographics, clinical information, treatment details, complications and health care provider information.

New Zealand Spinal Cord Injury Registry (Ministry of Health, Accident Compensation Corporation, Canterbury District Health Board & Counties Manukau Health, 2016)

Patients with acute spinal cord injury: patient demographics, clinical information, treatment details, outcome measures (including PROMs) and rehabilitation data in the two largest hospitals.

Turkish Spine Surgery Database (Turkish Spine Society – Utku, 2020)²

Surgical treatments: patient demographics, clinical information, treatment details, complications and health care provider information.

¹ Pilot, emerging, inactive and institutional or regional spine registries are not included. ² Translated from the original language to English with the help of DeepL translator ([https:// www.deepl.com /en/translator](https://www.deepl.com/en/translator)).

Appendix 3 Overview of terminology incorporated into the literature search strategy based on the three core concepts of this review: degenerative spinal conditions, spinal surgery and quality indicators

Degenerative spinal conditions	Spinal surgery	Quality indicator
Spine/spinal disease(s)	Spine/spinal surgery	Quality indicator(s)
Diseased spine	Spine/spinal procedure(s)	Quality measure(s)
Spine/spinal degeneration	Spine/spinal fusion	Quality measurement
Degeneration spine	Fused spine	Measured quality
Spine/spinal deformation	Spine/spinal fixation(s)	Quality improvement
Deformed spine	Spine/spinal decompression	Improved quality
Spine/spinal arthritis	Decompressed spine	Quality assessment
Spine/spinal osteoarthritis	Spine/spinal arthroplasty(-ies)	Quality assessing
Spine/spinal stenosis	(Inter)Vertebral surgery	Assessed quality
Spine/spinal osteophytosis	(Inter)Vertebral procedure(s)	Assessing quality
Spine/spinal osteochondrosis	(Inter)Vertebral fusion	Performance indicator(s)
(Inter)Vertebral disease(s)	(Inter)Vertebral fixation	Performance measure(s)
Diseased vertebra	(Inter)Vertebral decompression	Performance measurement
(Inter)Vertebral degeneration	(Inter)Vertebral arthroplasty(-ies)	Measured performance
Degenerated vertebra	Cervical/thoracic/lumbar surgery	Performance improvement
(Inter)Vertebral deformation(s)	Cervical/thoracic/lumbar procedure(s)	Improved performance
Deformed vertebra	Cervical/thoracic/lumbar fusion	Performance assessment
(Inter)Vertebral arthritis	Cervical/thoracic/lumbar fixation	Performance assessing
(Inter)Vertebral osteoarthritis	Cervical/thoracic/lumbar decompression	Assessed performance
(Inter)Vertebral stenosis	Cervical/thoracic/lumbar arthroplasty(-ies)	Assessing performance
(Inter)Vertebral osteophytosis	Disc/disk surgery	Outcome indicator(s)
(Inter)Vertebral osteochondrosis	Disc/disk procedure	Outcome measure(s)

Cervical/thoracic/lumbar disease(s)	Disc/disk replacement	Outcome measurement
Cervical/thoracic/lumbar degeneration	Replaced disc/disk	Measured outcome
Cervical/thoracic/lumbar deformation(s)	Disc/disk arthroplasty(-ies)	Outcome improvement
Cervical/thoracic/lumbar arthritis	Discogenic/diskogenic surgery	Improved outcome
Cervical/thoracic/lumbar osteoarthritis	Discogenic/diskogenic procedure(s)	Outcome assessment
Cervical/thoracic/lumbar stenosis	Discogenic/diskogenic replacement	Outcome assessing
Cervical/thoracic/lumbar osteophytosis	Discogenic/diskogenic arthroplasty(-ies)	Assessed outcome
Cervical/thoracic/lumbar osteochondrosis	Discal/diskal surgery	Assessing outcome
Disc/disk disease(s)	Discal/diskal procedure(s)	Guideline(s)
Diseased disc/disk	Discal/diskal replacement	Recommendation(s)
Disc/disk degeneration	Discal/diskal arthroplasty(-ies)	Consensus
Degenerated disc/disk	Discectomy(-ies)/ diskectomy(-ies)	
Disc/disk prolapse(s)	Microdiscectomy(-ies)/ Microdiskectomy(-ies)	
Prolapsed disc/disk	Laminotomy(-ies)	
Disc/disk herniation(s)	Laminectomy(-ies)	
Herniated disc/disk	Laminoplasty(-ies)	
Slipped disc/disk	Foraminotomy(-ies)	
Discogenic/diskogenic disease(s)	Facetectomy(-ies)	
Discogenic/diskogenic degeneration	Corpectomy(-ies)	
Discogenic/diskogenic prolapse(s)	Vertebroplasty(-ies)	
Discogenic/diskogenic herniation	Kyphoplasty(-ies)	
Discal/diskal disease(s)	Spondylodesis	
Discal/diskal degeneration		

Discal/diskal prolapse(s)
Discal/diskal herniation(s)
Discopathy/diskopathy
Spondylosis
Spondylolysis
Spondylolisthesis
Anterolisthesis
Retrolisthesis

Appendix 4 Web of Science – Search query

TS=(((spin* OR cervical OR thoracic OR lumbar OR vertebra* OR intervertebra* OR disc OR disk OR discogenic OR discogenic OR discal OR distal) NEAR/2 (degenerat* OR disease* OR deform* OR hernia* OR prolapse* OR sliced OR stenosis OR arthritis* OR osteophytosis OR osteochondrosis)) OR (discopathy OR discopathy OR spondylosis OR spondylolysis OR spondylolisthesis OR anterolisthesis OR retrolisthesis))

AND

TS=(((spin* OR cervical OR thoracic OR lumbar OR vertebra* OR intervertebra* OR disc OR disk OR discogenic OR discogenic OR discal OR distal) NEAR/2 (surg* OR procedure* OR fus* OR fixation* OR decompress* OR replace* OR arthroplast*)) OR (dis?ectom* OR microdis?ectom* OR laminotom* OR laminectom* OR laminoplast* OR foraminotom* OR facetectom* OR corpectom* OR vertebroplast* OR kyphoplast* OR spondylodesis))

AND

TS=(((quality OR performance OR outcome) NEAR/2 (indicator* OR measure* OR improv* OR assess*)) OR guideline* OR recommendation* OR consensus)

NOT TS=(animal*)

NOT TS=(pediatric OR paediatric OR adolescent* OR child* OR infant*)

Appendix 5 Medline (Ovid) - Search query

((spin* or cervical or thoracic or lumbar or vertebra* or intervertebra* or disc or disk or discogenic or diskogenic or discal or diskal) adj2 (degenerat* or disease* or deform* or hernia* or prolapse* or slipped or stenosis or arthritis* or osteophytosis or osteochondrosis)) or (discopathy or diskopathy or spondylosis or spondylolysis or spondylolisthesis or anterolisthesis or retrolisthesis)).ti,ab,kf.

OR

exp Intervertebral Disc Degeneration/ or exp Intervertebral Disc Displacement/ or exp "Ossification of Posterior Longitudinal Ligament"/ or exp Spinal Osteochondrosis/ or exp Spinal Osteophytosis/ or exp Spinal Stenosis/ or exp Osteoarthritis, Spine/ or exp Spondylosis/

AND

((spin* or cervical or thoracic or lumbar or vertebra* or intervertebra* or disc or disk or discogenic or diskogenic or discal or diskal) adj2 (surg* or procedure* or fus* or fixation* or decompress* or replace* or arthroplast*)) or (dis#ectom* or microdis#ectom* or laminotom* or laminectom* or laminoplast* or foraminotom* or facetectom* or corpectom* or vertebroplast* or kyphoplast* or spondylodesis)).ti,ab,kf.

OR

Spinal Fusion/ or Vertebroplasty/ or Discectomy/ or Laminectomy/ or Laminoplasty/ or Foraminotomy/ AND

((quality or performance or outcome) adj2 (indicator* or measure* or improv* or assess*)) or guideline* or recommendation* or consensus).ti,ab,kf.

OR

Quality Indicators, Health Care/ or Outcome Assessment, Health Care/ or "Quality of Health Care"/ or exp Guideline/ or Consensus/

NOT (Animals/ NOT (Animals/ AND Humans/))

NOT ((exp infant/ or exp child/ or adolescent/) not exp adult/)

Appendix 6 Scopus – Search query

TITLE-ABS-KEY((spin* OR cervical OR thoracic OR lumbar OR vertebra* OR intervertebra* OR disc* OR disk*) W/2 (degenerat* OR disease* OR deform* OR hernia* OR prolapse* OR stenosis OR arthritis* OR osteophytosis OR osteochondrosis) OR discopathy OR spondylosis OR spondylolysis OR spondylolisthesis OR anterolisthesis OR retrolisthesis)

AND

TITLE-ABS-KEY((spin* OR cervical OR thoracic OR lumbar OR vertebra* OR intervertebra* OR disc* OR disk*) W/2 (surg* OR procedure* OR fus* OR fixation* OR decompress* OR replace* OR arthroplast*) OR discectom* OR microdiscectom* OR laminotom* OR laminectom* OR laminoplast* OR foraminotom* OR facetectom* OR corpectom* OR vertebroplast* OR kyphoplast* OR spondylodesis)

AND

TITLE-ABS-KEY((quality OR performance OR outcome) W/2 (indicator* OR measure* OR improv* OR assess*) OR guideline* OR recommendation* OR consensus)

AND

NOT (INDEXTERMS(Animals) AND NOT INDEXTERMS(Humans))

AND

NOT ((INDEXTERMS(infant) OR INDEXTERMS(child) OR INDEXTERMS(adolescent)) NOT INDEXTERMS(adult))

Appendix 7 Study eligibility screening algorithm

Title and abstract screening phase

1. Is the article a duplicate of an already included article?

Yes: Exclude and mark as 'Duplicate'

No: Proceed to question 2

2. Is the article a peer-reviewed study? (i.e. other than case report, case series, technical note, cadaveric study, study protocol, feasibility analysis, conference abstract, editorial, expert opinion and letter to the editor)

Yes: Proceed to question 3

No: Exclude and mark as 'No peer-reviewed study'

3. Is the topic of the article related to adults with degenerative spinal disease?

Yes: Proceed to question 4

No: Exclude and mark as 'No degenerative spinal disease'

4. Is the topic of the article related to the development, evaluation or use of quality indicators (sometimes also referred to as quality measures or metrics) or guideline recommendations?

Yes: Proceed to question 5

No: Exclude and mark as 'No quality indicators'

Full text screening phase

5. Is the complete article available?

Yes: Proceed to question 6

No: Exclude and mark as 'Abstract only'

6. Does the article contain information about the development, evaluation or use of at least one quality indicator (or guideline recommendation) specific for degenerative spinal surgery?

Yes: Include

No: Exclude and mark as 'No degenerative spinal disease-specific quality indicators'

Appendix 8 Appraisal of Indicators through Research and Evaluation (AIRE) instrument

Item number	AIRE criteria	Score ¹
1.	Purpose, relevance and organisational context	
	- A The purpose of the indicator is described clearly. - B The criteria for selecting the topic of the indicator are described in detail. - C The organizational context of the indicator is described in detail. - D The quality domain the indicator addresses is described in detail. - E The health care process covered by the indicator is described and defined in detail.	
	Sub-total % ²	
2.	Stakeholder involvement	
	- A The group developing the indicator includes individuals from all relevant professional groups. - B Considering the purpose of the indicator, all relevant stakeholders have been involved at some stage of the development process. - C The indicator has been formally endorsed.	
	Sub-total %	
3.	Scientific evidence	
	- A Systematic methods were used to search for scientific evidence. - B The indicator is based on recommendations from an evidence-based guideline or studies published in peer-reviewed scientific journals. - C The supporting evidence has been critically appraised.	
	Sub-total %	
4.	Additional evidence, formulation, usage	
	- A The numerator and denominator are described in detail. - B The target patient population of the indicator is defined clearly. - C A strategy for risk adjustment has been considered and described. - D The indicator measures what it is intended to measure (validity). - E The indicator measures accurately and consistently (reliability). - F The indicator has sufficient discriminative power. - G The indicator has been piloted in practice. - H The efforts needed for data collection have been considered. - I Specific instructions for presenting and interpreting results.	
	Sub-total %	
	Total %	

¹ The items are scored on the Likert scale, where a score of 1 signifies that the criterion is not met or that relevant information is lacking, whereas a score of 4 indicates that the criterion is clearly met. A score of 2 or 3 reflects uncertainty with a tendency to respectively disagree or agree with the criterion.

² The score per item is summed up to obtain the total score for each domain. The domain scores are normalised via the following formula: $\frac{(\text{Domain score} - \text{Minimum possible score})}{(\text{Maximum} - \text{Minimum possible score})}$. The total score on the AIRE instrument is obtained by summing all normalised domain scores.

Appendix 9 Appraisal of Guidelines for Research and Evaluation Global Rating Scale (AGREE GRS)

Item number	AGREE GRS items	Score ¹
1.	Process of development - Rate the overall quality of the guideline development methods.	
	A Were appropriate stakeholders involved in development of the guideline?	NA ²
	B Was the evidentiary base developed systematically?	NA
	C Were recommendations consistent with the literature?	NA
	Sub-total	
2.	Presentation style - Rate the overall quality of the guideline presentation.	
	A Was the guideline well organised?	NA
	B Were the recommendations easy to find?	NA
	Sub-total	
3.	Completeness of reporting - Rate the completeness of reporting.	
	A Was the guideline development process transparent and reproducible?	NA
	B How complete was the information to inform decision-making?	NA
	Sub-total	
4.	Clinical validity - Rate the overall quality of the guideline recommendations.	
	A Are the recommendations clinically sound?	NA
	B Are the recommendations appropriate for the intended patients?	NA
	Sub-total	
	Overall assessment	
1.	Rate the overall quality of this guideline.	
	Sub-total	
2.	I would recommend this guideline for use in practice.	
	Sub-total	
3.	I would make use of a guideline of this quality in my professional decisions.	
	Sub-total	
	Total	

¹ The items are scored on the Likert scale, where a score of 1 signifies that the item is not met or that relevant information is lacking, whereas a score of 7 indicates that the item is clearly met. A score between 2 and 6 is assigned when not all of the included considerations are met. ² Not applicable, the included considerations serve as prompts to guide reflection and should not be scored individually.

Appendix 10 Appraisal of Guidelines for Research and Evaluation Recommendation Excellence (AGREE REX)

Item number	AGREE REX items	Score ¹
1.	Evidence	
	A Assessment of risk of bias related to study design of supporting evidence.	NA ²
	B The guideline describes the consistency of the results.	NA
	C The directness of the evidence to the clinical problem is addressed.	NA
	D The precision of the results is indicated.	NA
	E The magnitude of the benefits and harms is described.	NA
	F The likelihood of publication bias is assessed.	NA
	G The possibility of confounding factors is addressed (if applicable).	NA
	H The dose-response gradient is indicated (if applicable).	NA
	Sub-total	
2.	Applicability to target users	
	A A clinical problem that is relevant to intended target users is addressed.	NA
	B Alignment between user's scope of practice and targeted population.	NA
	C Alignment between user's scope of practice and recommended actions.	NA
	D Alignment between direction of recommendations and harm/benefit.	NA
	E Alignment between strength of recommendations and harm/benefit.	NA
	Sub-total	
3.	Applicability to patients/populations	
	A Outcomes that are relevant to targeted patients are included.	NA
	B Reports how importance of outcomes to patients was determined.	NA
	C Reports how to tailor recommendations to individuals or populations.	NA
	Sub-total	
4.	Values and preferences of target users	
	A Values and preferences of target users have been sought and considered.	NA
	B Target user acceptability of the recommendations has been considered.	NA
	C Differentiates when flexibility and tailoring is more appropriate.	NA
	D Describes range of recommendations that are acceptable to community.	NA
	Sub-total	
5.	Values and preferences of patients/populations	
	A Values and preferences of population have been sought and considered.	NA
	B Population acceptability of recommendations has been considered.	NA
	C Differentiates between recommendations for which patient choice likely plays a large part in the decision-making process and those who don't.	NA
	D States if tools to assist patient decision-making would be beneficial.	NA
	Sub-total	

6.	Values and preferences of policy/decision-makers	
A	Needs of policy/decision-makers have been sought and considered.	NA
B	Impact of recommendations on system-level have been considered.	NA
C	Impact of recommendations on health equities has been considered.	NA
D	Describes where changes to policy should be made.	NA
	Sub-total	
7.	Values and preferences of guideline developers	
A	Clear description of values and preferences that developers brought.	NA
B	Clear description of how developer values and preferences influenced the interpretation of the balance between benefits and harms.	NA
C	Method used to integrate values and preferences is described.	NA
	Sub-total	
8.	Purpose	
A	Recommendations align with the implementation goals of the guideline	NA
B	Anticipated impacts of recommendation adoption are described.	NA
	Sub-total	
9.	Local application and adoption	
A	Types and degree of change required from current practice are described.	NA
B	Differentiates in recommendations for relevancy of local adaptation.	NA
C	Articulates relevant factors important to its successful dissemination.	NA
D	Issues that can influence adoption of the recommendations and provided tools are considered, including strategies to overcome barriers	NA
	Sub-total	
	Total³	

Overall assessment

I would recommend these recommendations in the appropriate context

Yes	Yes, with modifications	No

¹ The items are scored on the Likert scale, where a score of 1 signifies that the item is not met or that relevant information is lacking, whereas a score of 7 indicates that the item is clearly met. A score between 2 and 6 is assigned when not all of the included considerations are met. The total score on the AGREE REX instrument is obtained by summing all normalised domain scores. ² Not applicable, the included considerations serve as prompts to guide reflection and should not be scored individually.

³ The score per item is summed up to obtain the total score for all items. The total score is normalised via the following formula: $\frac{(\text{Total item score} - \text{Minimum possible score})}{(\text{Maximum} - \text{Minimum possible score})}$.

Appendix 11 Overview of international, national and society-endorsed clinical practice guideline recommendations on degenerative spinal surgery¹

International Cervical spondylotic myelopathy: natural course and the value of diagnostic techniques – WFNS spine committee recommendations (World Federation of Neurosurgical Societies Spine Committee, 2019)

AGREE GRS: 5/5/5²

Myelopathic signs (hyperreflexia, inverted brachioradialis reflex, Hoffmann sign, Babinski and clonus) are an integral component of clinical diagnosis of cervical myelopathy. However, they are not very sensitive and may be absent in about 20% of myelopathic patients.

AIRE ³ score:	NA
Donabedian:	Process
AGREE REX ⁴ :	67%
Use in the appropriate context:	Yes, modifications
Comments:	Low sensitivity

Individual myelopathic signs taken alone cannot diagnose cervical myelopathy in all patients but at least one is present in severe myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

Clinical diagnosis of cervical spondylotic myelopathy relies heavily on characteristic symptoms and signs elicited during history and physical exam which prompt further investigation with cervical spine imaging.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

In severe myelopathic patients, after laminoplasty, major recovery in myelopathic signs occurs during the first 6 months and there after it plateaus.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

In patients with myelopathic signs, if there are no alternative explanations, a combination of clinical symptoms and imaging studies must form the basis of our treatment decisions. The absence of myelopathic signs does not preclude the diagnosis of cervical spondylotic myelopathy nor its successful surgical treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Electrophysiological tests to be used in cervical spondylotic myelopathy patients are (in order of benefits): Motor evoked potential (MEP), spinal cord evoked potential (SCEP), somatosensory evoked potential (SSEP) and electromyography (EMG).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Heterogeneous evidence

Routine electrophysiological tests are useful in differential diagnosis of cervical spondylotic myelopathy from other neurological conditions. However, especially during the early course of the disease differential diagnosis is very difficult, specific tests are necessary and mild forms of amyotrophic lateral sclerosis and polyneuropathy may not be differentiated easily.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Low specificity

Although MEP and SSEP have been found as valuable tests to predict outcomes of cervical spondylotic myelopathy surgery, there is no evidence that they are more valuable than clinical parameters.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Electrophysiological tests may have better outcome predictions than magnetic resonance imaging (MRI) changes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Electrophysiological tests are not very useful in monitoring lower extremity power, and the value of monitoring during anterior discectomy and fusion (ACDF) surgery is questionable.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	50%
Use in the appropriate context:	No
Comments:	Very low quality evidence

EMG and MEP monitoring have been found to be useful to decrease C5 root palsy during cervical spondylotic myelopathy surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Intraoperative MEP/SSEP worsening is not specific, and it does not show clinical worsening in every incidence. Intraoperative MEP/SSEP changes do not necessarily prevent neurological injury and improve the outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low specificity

In spite of conflicting evidence, MRI morphometric analysis of the spine has a significant role in evaluation and prognostication of cervical spondylotic myelopathy and it should be included in the preoperative workup.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Conflicting evidence

Among the many variables assessed using MRI – compression ratio, maximum canal compromise, and transverse area are most importantly correlated with functional outcomes following surgery in patients with cervical spondylotic myelopathy. Each parameter has its own strengths and limitations, therefore a combined assessment of MRI parameters has a greater predictive yield.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Spinal cord T2 hyperintensity on cervical MRI may be correlated with a worse outcome in cervical spondylotic myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Patients with lighter signal changes in T2 on cervical MRI should not be excluded from surgical treatment of cervical spondylotic myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Diffusion MRI, MR Spectroscopy, and diffusion MRI may be a part of MRI examinations for cervical spondylotic myelopathy protocol apart from conventional MRI. We suggest their usage for outcome studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	50%
Use in the appropriate context:	No
Comments:	Research only

Anterior surgical techniques for cervical spondylotic myelopathy: WFNS Spine Committee Recommendations (World Federation of Neurosurgical Societies, 2019)

AGREE GRS: 4/5/5

In patients with cervical spondylotic myelopathy, the indications for surgery include persistent or recurrent radiculopathy nonresponsive to conservative treatment (3 years); progressive neurological deficit; static neurological deficit with severe radicular pain when associated with confirmatory imaging (computed tomography, magnetic resonance imaging) and clinical-radiological correlation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The indications of anterior surgery for patients with cervical spondylotic myelopathy include straightened spine or kyphotic spine with a compression level below 3.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There are many options for anterior decompression such as ACDF, anterior cervical corpectomy and fusion, oblique corpectomy, skip corpectomy and hybrid surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

A corpectomy is a good option for a ventral compression of less than 3 vertebral segments where a single-level disc and osteophyte excision are inadequate to decompress the cord in patients with cervical spondylotic myelopathy. In cases with a kyphotic deformity of the cervical spine, corpectomy can restore the normal lordotic curvature alignment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In cases of a multisegment disease with contiguous multisegment thecal compression, alternate segment discectomy/osteophyte removal while keeping the body of the intervening vertebra intact is biomechanically more stable than a complete corpectomy with contiguous segment discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

An oblique partial corpectomy can improve the sagittal canal diameter substantially. However, this procedure may be difficult to perform in cases with bilateral radiculopathy. If there is significant instability, oblique corpectomy should not be chosen.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In the elderly age groups with bony ankylosis due to osteophytes at C5–6–7, cervical spondylotic myelopathy may manifest at higher levels where motion segments are preserved, especially the C3–4 level and also at lower levels such as the C7–T1 level.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Reported complications resulting from anterior surgeries for cervical spondylotic myelopathy are quite variable. Approach-related complications (dysphagia, dysphonia, oesophageal injury, respiratory distress etc.) are more often than neurologic, and implant-related complications. With the appropriate choice of implants and meticulous surgical technique, the surgical complications should be seen only rarely

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Improvement after anterior surgery for cervical spondylotic myelopathy has been reported in 70% to 80% of patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

There is no significant difference in success rates with ACDF, anterior cervical corpectomy and fusion, and oblique corpectomy

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

ACDF is generally associated with less intraoperative blood loss and less operative complications than anterior cervical corpectomy and fusion. The functional outcomes, using Odom criteria and Neck Disability Index are reported to be the same.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Natural course and diagnosis of lumbar spinal stenosis: WFNS spine committee recommendations (World Federation of Neurosurgical Societies, 2020)

AGREE GRS: 4/5/5

MRI is the most appropriate non-invasive test for the diagnosis of lumbar spinal stenosis and the second is computed tomography (CT). CT myelography is appropriate if MRI is contraindicated or inconclusive.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

There is no correlation between clinical symptoms or function with the presence of anatomic narrowing of the spinal canal on MRI, CT or CT myelography.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Qualitative radiologic criteria describe adequately spinal stenosis in central, lateral or foraminal stenosis

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited actionability

There are some radiologic signs that describe instability: Direct signs on functional radiograms, indirect signs on MRI and CT such as Modic changes, end-plate oedema, extended discal vacuum, traction spurs, synovial cysts, annular tears, spondylolisthesis and 'facet fluid sign'.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited actionability

Routine electrophysiological tests (EMG, nerve conduction study, F-wave response, H-reflex, SSEP, MEP) have no diagnostic value for lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Electrophysiological tests do not predict the outcome of patients with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Fusion surgery for lumbar spinal stenosis: WFNS spine committee recommendations (World Federation of Neurosurgical Societies, 2020)

AGREE GRS: 4/4/4

In patients with lumbar spinal stenosis and no sign or symptoms of instability and predominant leg pain, decompression alone is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In patients with stenosis and stable spondylolisthesis, fusion is not mandatory and decompression alone is suggested.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Unstable spondylolisthesis with symptoms may require fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no consensus if the main complaint is mechanical axial low back pain, which is more than leg pain, the patient may benefit from a fusion surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Patients with lumbar spinal stenosis and loss of sagittal balance, if symptomatic, may benefit from decompression, fixation, and deformity correction surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Fusion may be advisable in patients who undergo bilateral facetectomy of more than 50% and bilateral discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Facet joint effusion alone is not proven to correlate with stability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Mobility-preserving surgery for lumbar spinal stenosis: WFNS Spine Committee Recommendations (World Federation of Neurosurgical Societies, 2020)

AGREE GRS: 4/3/3

Decompression is the basis of surgical treatment of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Fusion is an option, especially when spondylolisthesis or instability are present, but indications remain controversial.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Adjacent segment disease incidence reports display high variability. Adjacent segment disease may represent the natural progression of degenerative disease in many cases. It may be rare with single level fusion (except 'floating fusion' at L4-5), or in patients with minimal degenerative disease. Older age, poor sagittal balance, multilevel fusion may be associated with more adjacent segment disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Dynamic fixation constructs are treatment options that may help to prevent adjacent segment disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Consensus statement for perioperative care in lumbar spinal fusion: Enhanced Recovery After Surgery (ERAS) Society recommendations (Enhanced Recovery After Surgery Society, 2021)

AGREE GRS: 5/6/5

Preoperative patient education is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Evidence is currently insufficient to make a recommendation on prehabilitation as an essential intervention for all patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Patients undergoing lumbar fusion should undergo a preoperative nutritional assessment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Preoperative nutritional interventions should be offered to patients identified as malnourished.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A combined smoking cessation therapy at a minimum of 4 weeks before surgery is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Alcohol cessation programs 4–8 weeks before surgery can reduce postoperative complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Clear fluid should be permitted up to 2 hours and solid foods up to 6 hours before the induction of general anaesthesia.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Evidence is currently insufficient to make a recommendation on routine use of oral carbohydrate load for lumbar spine fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

The routine administration of sedatives to reduce anxiety preoperatively is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

The routine preoperative administration of acetaminophen, NSAIDs and gabapentin as part of a multimodal opioid sparing analgesia strategy is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	53%
Use in the appropriate context:	No
Comments:	Limited evidence, individual

Preoperative anaemia should be assessed and corrected prior to lumbar fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

A care bundle should be implemented, including administration of a broad-spectrum antibiotic covering *S. aureus* and skin preparation using either alcohol-based iodine or chlorohexidine solution. Administration of a broad-spectrum antibiotic covering *S. aureus* (with possibility of repeating doses during longer surgeries).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Antiseptic dressing the night before surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, resources

Skin preparation using use of either alcohol-based iodine or chlorohexidine solution.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Modern general anaesthesia, including the use of neuromuscular blockade and neuraxial techniques should be used as part of multimodal anaesthetic strategies follow local policy and availability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Normothermia should be maintained peri- and postoperatively through pre-warming and the active warming of patients intraoperatively.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Surgical technique should be decided on a case-by-case basis factoring the goals of surgery, training and experience of the surgeon, and the availability of technology at the local institution.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Use of intrathecal morphine, epidural analgesia, locoregional blocks or wound infiltration with long-acting local anaesthetics should be used to improve postoperative pain management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, resources

Intravenous fluids should maintain near-euvolemic status.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Goal directed fluid management is not needed for 1-2 level lumbar fusion but should be considered if significant patient co-morbidities exist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

An early return to normal diet is recommended and should be promoted.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The routine use of urinary catheters is not recommended for short-segment elective lumbar spinal fusions with or without concomitant decompression. When used, they should be removed within hours of surgery with close monitoring.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The routine use of multimodal analgesic regimens to improve pain control and reduce opioid consumption is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Risk assessment for postoperative nausea and vomitus, routinely use of multimodal prophylaxis based on assessment, and rescue with different class of anti-emetics are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Routine wound drainage is not recommended for short-segment lumbar fusion surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Early ambulation and the use of mechano-prophylaxis should be encouraged in all patients after spinal surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Pharmaceutical antithrombotic prophylaxis should be reserved for specific risk groups, while no recommendation can be made with regard to its standardized use.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, resources

Early mobilization and early physical therapy are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings (World Health Organisation, 2023)

AGREE GRS: 5/6/6

Structured and standardized education and/or advice interventions may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

A structured exercise therapy or programme may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Needling therapies such as acupuncture may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Spinal manipulative therapy may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Massage may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Traction should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Therapeutic ultrasound should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Transcutaneous electrical nerve stimulation (TENS) should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Lumbar braces, belts and/or supports should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Qualitative, affordable mobility assistive products should be offered to adults, including older people, with chronic primary low back pain, based on a person centred assessment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Good practice

Operant therapy may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

The balance between the benefits and harms for respondent therapy in managing chronic primary low back pain in adults, including older people, is so equivocal that a recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient benefit

The balance between the benefits and harms for cognitive therapy in managing chronic primary low back pain in adults, including older people, is so equivocal that a recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient benefit

Cognitive behavioural therapy may be offered as part of care to adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The balance between the benefits and harms for mindfulness based stress reduction therapy in managing chronic primary low back pain in adults, including older people, is so equivocal that a recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient benefit

Opioid analgesics should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

NSAIDs may be offered as part of care to adults with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Serotonergic noradrenergic antidepressants should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Tricyclic antidepressants should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Anticonvulsants should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Skeletal muscle relaxants should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Glucocorticoids should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

No recommendation. There were no trials identified that evaluated the benefits or harms of paracetamol (acetaminophen) in the management of chronic primary low back pain in adults.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. There were no trials identified that evaluated the benefits or harms of benzodiazepines in the management of chronic primary low back pain in adults

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. There were no trials identified that evaluated the benefits or harms of cannabis-related pharmaceutical preparations for therapeutic use in the management of chronic primary low back pain in adults.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Injectable local anaesthetics should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Topical Cayenne pepper (*Capsicum frutescens*) may be offered as part of care to adults with chronic primary low back pain, including older people.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Devil's claw (*Harpagophytum procumbens*) should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

White willow (*Salix* spp.) should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

No recommendation. The evidence regarding the benefits and harms of topical Brazilian arnica (*Solidago chilensis*) in managing chronic primary low back pain in adults is insufficient to formulate a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. The evidence regarding the benefits and harms of Ginger (*Zingiber officinale* Roscoe) in managing chronic primary low back pain in adults is insufficient to formulate a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. The evidence regarding the benefits and harms of topical white lily (*Lilium candidum*) in managing chronic primary low back pain in adults is insufficient to formulate a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. The evidence regarding the benefits and harms of a topical combination herbal compress in managing chronic primary low back pain in adults is insufficient to formulate a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation. The evidence regarding the benefits and harms of a topical combination herbal transdermal patch in managing chronic primary low back pain in adults is insufficient to formulate a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Pharmacological weight loss should not be used as part of routine care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

No recommendation. The balance between the benefits and harms for non-pharmacological weight loss in managing chronic primary low back pain in adults, including older people, is so equivocal that a recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Multicomponent biopsychosocial care delivered by a multidisciplinary team may be offered as part of care for adults, including older people, with chronic primary low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Lumbar disc herniation: Prevention and treatment of recurrence: WFNS spine committee recommendations (World Federation of Neurosurgical Societies, 2024)

AGREE GRS: 4/4/4

Smoking, younger age, male gender, obesity, diabetes, the persistence of weightlifting after the first surgery, Modic changes, Pfirrmann grade, migration grade, large segmental range-of-motion, presence of lumbosacral transitional vertebrae may be factors to predict recurrence of disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Minimally invasive discectomies (endoscopic etc.) may have higher recurrence rates. The level of lumbar discectomy surgery and the amount of disc material removed has no correlation with the rate of recurrence. There is a trend toward intervertebral disc lavage reducing the rate of recurrence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality assessment

There is no linear relationship between the experience of the surgeon and the rate of reoperation. However, more recurrent herniations can be observed during the learning period for endoscopic and tube-guided surgeries.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality evidence

Among patients with large annular defects following lumbar discectomy, additional implantation of annular repair devices may lower the risk of recurrence in 1 and-2-year follow-up. However, the long-term results are not well known.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

There is no evidence to conclude that recurrence can be prevented by activity restriction, weight loss, smoking cessation, and muscle-strengthening exercises.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

There is no good evidence to decide the best treatment option for recurrent disc herniation. Although back pain responds more to discectomy and fusion, the routine addition of fusion surgery for recurrent lumbar disc herniation is not recommended. Fusion should only be considered an option when spinal instability, spinal deformity, or associated radiculopathy is present. Although complications are less with microdiscectomy than with open discectomy, the outcomes are similar. Therefore, when we compare the costs of treatment options, conservative treatment is more cost-effective, followed by discectomy and then discectomy and fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Clinical outcomes after surgical therapy of recurrent disc herniations are inferior to initial surgery. Patient satisfaction after primary discectomy has been found to be 79%, and after recurrent discectomy, 58%.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Role of surgery in primary lumbar disk herniation: WFNS spine committee recommendations (World Federation of Neurosurgical Societies, 2024)

AGREE GRS: 4/6/6

Surgery for lumbar disc herniation is individualized. It is recommended for failure of conservative treatment, severe motor deficit, progressive neurological impairment, cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

Earlier surgery in lumbar disc herniation is suggested in case of major motor deficit and is associated with faster recovery and might improve motor outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Although minimally invasive procedures have short term advantages, there is insufficient evidence to make a recommendation for or against the choice of a specific surgical procedure for lumbar disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Sequestrectomy and standard microdiscectomy have similar clinical results in terms of pain control, recurrence rate, functional outcome and complications at short/medium term.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Lumbar fusion is not recommended as a routine treatment following primary discectomy in patients with isolated herniated lumbar discs causing radiculopathy. Lumbar fusion may be considered in patients with herniated discs who have evidence of significant chronic axial back pain, have severe degenerative changes or have instability associated with radiculopathy caused by herniated lumbar discs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

North America An evidence-based clinical guideline for the use of antithrombotic therapies in spine surgery (North American Spine Society, 2009)

AGREE GRS: 3/5/5

Mechanical compression devices in the lower extremities are suggested in elective spinal surgery to decrease the incidence of thromboembolic complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Thromboembolic deterrent stockings in combination with acetylsalicylic acid are an option in elective spinal surgery to decrease the incidence of thromboembolic complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Most commonly performed elective spine surgeries done through a posterior approach are associated with a very low risk of venous thrombo-embolism. In this setting, chemoprophylaxis may not be warranted, as it is accompanied by a definable risk of serious wound and bleeding complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Low molecular weight heparin or low dose warfarin may be used postoperatively to lower the risk of thromboembolic complications after elective combined anterior-posterior (circumferential) spine surgery or in patients identified as having a high risk of thromboembolic disease, such as multiple trauma, malignancy or hypercoagulable state. These therapies should be considered carefully and on an individual case-by-case basis, as use may place patients at increased risk of bleeding complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Initiation of mechanical compression just before or at the beginning of surgery and continuation until the patient is fully ambulatory is a reasonable practice.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Most commonly performed elective spine surgeries done through a posterior approach are associated with a very low risk of venous thrombo-embolism. In this setting, chemoprophylaxis may not be warranted, as it is accompanied by a definable risk of serious wound and bleeding complications. When chemoprophylaxis is used, neurological status should be monitored.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

It is the work group's recommendation that low molecular weight heparin be used cautiously before routine, elective spinal surgery and withheld unless there are other risk factors for thromboembolism.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The available literature does not support an ideal duration for which chemoprophylaxis should be continued after spinal surgery. It is the work group's recommendation that this parameter be decided based on the underlying pathological condition being treated, comorbidities (e.g. heart valve, previous DVT, stent restenosis prophylaxis), and other host factors, such as ambulatory and neurological status.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

It is the work group’s recommendation that the magnitude of surgical insult and underlying thromboembolic risk be balanced against the risk for epidural bleeding and wound complications. Although not substantiated by evidence, the work group agreed that the use of intravenous heparin is a reasonable bridge therapy for those patients being indefinitely treated with warfarin for a non-spine condition. The rationale for this statement is that intravenous heparin is more controllable and more predictable than low molecular weight heparin, although low molecular weight heparin is a reasonable alternative bridge therapy. The ideal time to discontinue agents, such as clopidogrel and aspirin, is unique to the pharmacokinetics of the particular medication, as it is influenced by the clearance half-life; however, an interval of approximately 1 week before surgery seems prudent.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Interventional therapies, surgery and interdisciplinary rehabilitation for low back pain:
An evidence-based clinical practice guideline from the American Pain Society
(American Pain Society, 2009)

AGREE GRS: 4/6/5

In patients with chronic non-radicular low back pain, provocative discography is not recommended as a procedure for diagnosing discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to evaluate validity or utility of diagnostic selective nerve root block, intra-articular facet joint block, medial branch block or sacroiliac joint block as diagnostic procedures for low back pain with or without radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In patients with non-radicular low back pain who do not respond to usual, non-interdisciplinary interventions, it is recommended that clinicians consider intensive interdisciplinary rehabilitation with a cognitive/behavioural emphasis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Chronic back pain is a complex condition that involves biologic, psychological, and environmental factors. For patients with persistent and disabling back pain despite recommended non-interdisciplinary therapies, clinicians should counsel patients about interdisciplinary rehabilitation (defined as an integrated intervention with rehabilitation plus a psychological and/or social/occupational component) as a treatment option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In patients with persistent non-radicular low back pain, facet joint corticosteroid injection, prolotherapy and intradiscal corticosteroid injection are not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is insufficient evidence to adequately evaluate benefits of local injections, botulinum toxin injection, epidural steroid injection, intradiscal electrothermal therapy, therapeutic medial branch block, radiofrequency denervation, sacroiliac joint steroid injection or intrathecal therapy with opioids or other medications for non-radicular low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In patients with non-radicular low back pain, common degenerative spinal changes, and persistent and disabling symptoms, it is recommended that clinicians discuss risks and benefits of surgery as an option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended that shared decision-making regarding surgery for nonspecific low back pain include a specific discussion about intensive interdisciplinary rehabilitation as a similarly effective option, the small to moderate average benefit from surgery versus non-interdisciplinary nonsurgical therapy, and the fact that the majority of such patients who undergo surgery do not experience an optimal outcome (defined as minimum or no pain, discontinuation of or occasional pain medication use and return of high-level function).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In patients with non-radicular low back pain, common degenerative spinal changes, and persistent and disabling symptoms, there is insufficient evidence to adequately evaluate long-term benefits and harms of vertebral disc replacement (insufficient evidence).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In patients with persistent radiculopathy due to herniated lumbar disc, it is recommended that clinicians discuss risks and benefits of epidural steroid injection as an option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that shared decision-making regarding epidural steroid injection include a specific discussion about inconsistent evidence showing moderate short-term benefits, and lack of long-term benefits. There is insufficient evidence to adequately evaluate benefits and harms of epidural steroid injection for spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In patients with persistent and disabling radiculopathy due to herniated lumbar disc or persistent and disabling leg pain due to spinal stenosis, it is recommended that clinicians discuss risks and benefits of surgery as an option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that shared decision-making regarding surgery include a specific discussion about moderate average benefits, which appear to decrease over time in patients who undergo surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

In patients with persistent and disabling radicular pain following surgery for herniated disc and no evidence of a persistently compressed nerve root, it is recommended that clinicians discuss risks and benefits of spinal cord stimulation as an option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that shared decision-making regarding spinal cord stimulation include a discussion about the high rate of complications following spinal cord stimulator placement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders (North American Spine Society, 2011)

AGREE GRS: 6/6/6

It is suggested that the diagnosis of cervical radiculopathy be considered in patients with arm pain, neck pain, scapular or periscapular pain, and paraesthesia's, numbness and sensory changes, weakness or abnormal deep tendon reflexes in the arm. These are the most common clinical findings seen in patients with cervical radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

It is suggested that the diagnosis of cervical radiculopathy be considered in patients with atypical findings such as deltoid weakness, scapular winging, weakness of the intrinsic muscles of the hand, chest or deep breast pain and headaches. Atypical symptoms and signs are often present in patients with cervical radiculopathy and can improve with treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Provocative tests including the shoulder abduction and Spurling's tests may be considered in evaluating patients with clinical signs and symptoms consistent with the diagnosis of cervical radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Because dermatomal arm pain alone is not specific in identifying the pathologic level in patients with cervical radiculopathy, further evaluation including CT, CT myelography or MRI is suggested before surgical decompression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

MRI is suggested for the confirmation of correlative compressive lesions (disc herniation and spondylosis) in cervical spine patients who have failed a course of conservative therapy and who may be candidates for interventional or surgical treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

In the absence of reliable evidence, it is the work group's opinion that CT may be considered as the initial study to confirm a correlative compressive lesion (disc herniation or spondylosis) in cervical spine patients who have failed a course of conservative therapy, who may be candidates for interventional or surgical treatment, and who have a contraindication to MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

CT myelography is suggested for the evaluation of patients with clinical symptoms or signs that are discordant with MRI findings (e.g. foraminal compression that may not be identified on MRI). CT myelography is also suggested in patients who have a contraindication to MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The evidence is insufficient to make a recommendation for or against the use of EMG for patients in whom the diagnosis of cervical radiculopathy is unclear after clinical examination and MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Selective nerve root block with specific dosing and technique protocols may be considered in the evaluation of patients with cervical radiculopathy and compressive lesions identified at multiple levels on MRI or CT myelography to discern the symptomatic levels. Selective nerve root block may also be considered to confirm a symptomatic level in patients with discordant clinical symptoms and MRI or CT myelography findings.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

The Neck Disability Index, Short Form-36, Short Form 12, and Visual analogue scale are recommended outcome measures for assessing treatments of cervical radiculopathy from degenerative disorders.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

The modified Prolo, Patient-Specific Functional Scale, Health Status Questionnaire, Sickness Impact Profile, Modified Million Index, McGill Pain Scores and modified Oswestry Disability Index are suggested outcome measures for assessing treatment of cervical radiculopathy from degenerative disorders.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Emotional and cognitive factors (e.g. job dissatisfaction) should be considered when addressing surgical or medical/ interventional treatment for patients with cervical radiculopathy from degenerative disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

As the efficacy of manipulation in the treatment of cervical radiculopathy from degenerative disorders is unknown, careful consideration should be given to evidence suggesting that manipulation may lead to worsened symptoms or significant complications when considering this therapy. Pre-manipulation imaging may reduce the risk of complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Cautionary recommendation

Transforaminal epidural steroid injections using fluoroscopic or CT guidance may be considered when developing a medical/interventional treatment plan for patients with cervical radiculopathy from degenerative disorders. Due consideration should be given to the potential complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate evidence, risk

Ozone injections, cervical halter traction and combinations of medications, physical therapy, injections, and traction have been associated with improvements in patient-reported pain in uncontrolled case series. Such modalities may be considered recognizing that no improvement relative to the natural history of cervical radiculopathy has been demonstrated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	37%
Use in the appropriate context:	No
Comments:	No comparative benefit

Surgical intervention is suggested for the rapid relief of symptoms of cervical radiculopathy from degenerative disorders when compared with medical / interventional treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Both anterior cervical decompression and ACDF are suggested as comparable treatment strategies, producing similar clinical outcomes, in the treatment of single-level cervical radiculopathy from degenerative disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

The addition of an interbody graft for fusion is suggested to improve sagittal alignment after anterior cervical decompression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Both ACDF with and without a plate are suggested as comparable treatment strategies, producing similar clinical outcomes and fusion rates, in the treatment of single-level cervical radiculopathy from degenerative disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The addition of a cervical plate is suggested to improve sagittal alignment after ACDF.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Outcomes not clearly better

Although plate stabilization may be indicated in some patients undergoing multilevel ACDF, there is insufficient evidence that this practice results in significant improvement in clinical outcomes for degenerative cervical radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Outcomes not clearly better

Either ACDF or posterior foraminotomy are suggested for the treatment of single-level degenerative cervical radiculopathy secondary to foraminal soft disc herniation to achieve comparably successful clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Compared with posterior laminoforaminotomy, ACDF is suggested for the treatment of single-level degenerative cervical radiculopathy from central and paracentral nerve root compression and spondylotic disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

ACDF and total disc arthroplasty are suggested as comparable treatments, resulting in similarly successful short-term outcomes, for single-level degenerative cervical radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Surgery is an option for the treatment of single-level degenerative radiculopathy to produce and maintain favourable long-term (>4 years) outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Low back pain - Clinical practice guidelines linked to the international classification of functioning, disability and health from the orthopaedic section of the American Physical Therapy Association (American Physical Therapy Association, 2012)

AGREE GRS: 4/5/4

Current literature does not support a definitive cause for initial episodes of low back pain. Risk factors are multi-factorial, population specific and only weakly associated with the development of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The clinical course of low back pain can be described as acute, subacute, transient, recurrent or chronic. Given the high prevalence of recurrent and chronic low back pain and the associated costs, clinicians should place high priority on interventions that prevent (1) recurrences and (2) the transition to chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Low back pain, without symptoms or signs of serious medical or psychological conditions, associated with 1) mobility impairment in the thoracic, lumbar, or sacroiliac regions, 2) referred or radiating pain into a lower extremity and 3) generalized pain are useful clinical findings for classifying a patient with low back pain into the following International Statistical Classification of Diseases and Related Health Problems categories: low back pain, lumbago, lumbosacral segmental/somatic dysfunction, low back strain, spinal instabilities, flatback syndrome, lumbago due to displacement of intervertebral disc, lumbago with sciatica and the associated International Classification of Functioning, Disability, and Health impairment-based category of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Clinicians should consider diagnostic classifications associated with serious medical conditions or psychosocial factors and initiate referral to the appropriate medical practitioner when (1) the patient's clinical findings are suggestive of serious medical or psychological pathology, (2) the reported activity limitations or impairments of body function and structure are not consistent with those presented in the diagnosis/classification section of this guideline or (3) when the patient's symptoms are not resolving with interventions aimed at normalization of the patient's impairments of body function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Clinicians should use validated self-report questionnaires, such as the Oswestry Disability Index and the Roland-Morris Disability Questionnaire. These tools are useful for identifying a patient's baseline status relative to pain, function and disability and for monitoring a change in patient's status throughout the course of treatment.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Clinicians should routinely assess activity limitation and participation restriction through validated self-report or performance based measures. Changes in the patient's level of activity limitation and participation restriction should be monitored with these same measures over the course of treatment.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Clinicians should consider utilizing thrust manipulative procedures to reduce pain and disability in patients with mobility deficits and acute low back and back-related buttock or thigh pain. Thrust manipulative and non-thrust mobilization procedures can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Clinicians should consider utilizing trunk coordination, strengthening and endurance exercises to reduce low back pain and disability in patients with subacute and chronic low back pain with movement coordination impairments and in patients post lumbar microdiscectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Clinicians should consider utilizing repeated movements, exercises or procedures to promote centralization to reduce symptoms in patients with acute low back pain with related (referred) lower extremity pain. Clinicians should consider using repeated exercises in a specific direction determined by treatment response to improve mobility and reduce symptoms in patients with acute or subacute low back pain with mobility deficits.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Clinicians can consider flexion exercises, combined with other interventions such as manual therapy, strengthening exercises, nerve mobilization procedures and progressive walking for reducing pain and disability in older patients with chronic low back pain with radiating pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Clinicians should consider utilizing lower quarter nerve mobilization procedures to reduce pain and disability in patients with subacute and chronic low back pain and radiating pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

There is conflicting evidence for the efficacy of intermittent lumbar traction for patients with low back pain. There is preliminary evidence that a subgroup of patients with signs of nerve root compression along with peripheralization of symptoms or a positive crossed straight leg raise will benefit from intermittent lumbar traction in the prone position. There is moderate evidence that clinicians should not utilize intermittent or static lumbar traction for reducing symptoms in patients with acute or subacute, non-radicular low back pain or for patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	No recommendation
Comments:	None

Clinicians should not utilize patient education and counselling strategies that either directly or indirectly increase the perceived threat or fear associated with low back pain, such as education and counselling strategies that 1) promote extended bed-rest or 2) provide in-depth, pathoanatomical explanations for the causes of low back pain. Patient education and counselling strategies for patients with low back pain should emphasize 1) the promotion of the understanding of the anatomical/structural strength inherent in the human spine, 2) the neuroscience that explains pain perception, 3) the overall favourable prognosis of low back pain, 4) the use of active pain coping strategies that decrease fear and catastrophizing, 5) the early resumption of normal or vocational activities, even when still experiencing pain and 6) the importance of improvement in activity levels, not just pain relief.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Clinicians should consider 1) moderate to high intensity exercise for patients with chronic low back pain without generalized pain, and 2) incorporating progressive, low intensity, sub-maximal fitness and endurance activities into the pain management and health promotion strategies for patients with chronic low back pain with generalized pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The diagnosis of lumbar spinal stenosis may be considered in older patients presenting with a history of gluteal or lower extremity symptoms exacerbated by walking or standing which improves or resolves with sitting or bending forward. Patients whose pain is not made worse with walking have a low likelihood of stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to make a recommendation for or against the use of self-administered questionnaires to improve accuracy of the diagnosis of spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against certain physical findings for the diagnosis of degenerative lumbar spinal stenosis including an abnormal Romberg test, thigh pain exacerbated with extension, sensorimotor deficits, leg cramps, and abnormal Achilles tendon reflexes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the diagnostic reliability of patient-reported dominance of lower extremity pain and low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In patients with history and physical examination findings consistent with degenerative lumbar spinal stenosis, MRI is suggested as the most appropriate non-invasive test to confirm the presence of anatomic narrowing of the spinal canal or the presence of nerve root impingement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

In patients with history and physical examination findings consistent with degenerative lumbar spinal stenosis for whom MRI is either contraindicated or inconclusive, CT myelography is suggested as the most appropriate test to confirm the presence of anatomic narrowing of the spinal canal or the presence of nerve root impingement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In patients with history and physical examination findings consistent with degenerative lumbar spinal stenosis for whom MRI and CT myelography are contraindicated, inconclusive, or inappropriate, CT is the preferred test to confirm the presence of anatomic narrowing of the spinal canal or the presence of nerve root impingement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

MRI or CT with axial loading is suggested as a useful adjunct to routine imaging in patients who have clinical signs and symptoms of lumbar spinal stenosis, a dural sac area of less than 110 mm² at one or more levels, and suspected but not verified central or lateral stenosis on routine unloaded MRI or CT.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited availability, expertise

It is suggested that readers use well-defined, articulated and validated criteria for anatomic canal narrowing on MRI, CT myelography and CT to improve interobserver and intra-observer reliability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

There is insufficient evidence to make a recommendation for or against a correlation between clinical symptoms or function with the presence of anatomic narrowing of the spinal canal on MRI, CT myelography or CT.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In the absence of reliable evidence, it is the work group's opinion that imaging studies be considered as a first-line diagnostic test in the diagnosis of degenerative lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Electromyographic paraspinal mapping is suggested to confirm the diagnosis of degenerative lumbar spinal stenosis in patients with mild or moderate symptoms and radiographic evidence of stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, specialised

There is insufficient evidence to make a recommendation for or against the use of F wave, H reflex, MEP, motor nerve conduction studies, SSEP, dermatomal sensory-evoked potentials, and lower extremity EMG in the confirmation of lumbar spinal stenosis. These studies may be used to help identify other comorbidities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the use of pharmacological treatment in the management of spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the use of physical therapy or exercise as stand-alone treatments for degenerative lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In the absence of reliable evidence, it is the work group's opinion that a limited course of active physical therapy is an option for patients with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is insufficient evidence to make a recommendation for or against spinal manipulation for the treatment of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Contrast-enhanced fluoroscopy is recommended to guide epidural steroid injections to improve the accuracy of medication delivery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Resources

Interlaminar epidural steroid injections are suggested to provide short-term (2 weeks to 6 months) symptom relief in patients with neurogenic claudication or radiculopathy. There is, however, conflicting evidence concerning long term (21.5–24 months) efficacy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

A multiple injection regimen of radiographically guided transforaminal epidural steroid injection or caudal injections is suggested to produce medium-term (3–36 months) relief of pain in patients with radiculopathy or neurogenic intermittent claudication from lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate evidence, risk

The use of a lumbosacral corset is suggested to increase walking distance and decrease pain in patients with lumbar spinal stenosis. There is no evidence that results are sustained once the brace is removed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, short-term

There is insufficient evidence to make a recommendation for or against traction, electrical stimulation, or transcutaneous electrical stimulation for the treatment of patients with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against acupuncture in for the treatment of patients with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Medical/interventional treatment may be considered to provide long-term (2–10 years) improvement in patients with degenerative lumbar spinal stenosis and has been shown to improve outcomes in a large percentage of patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Decompressive surgery is suggested to improve out comes in patients with moderate to severe symptoms of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	89%
Use in the appropriate context:	Yes
Comments:	None

Medical/interventional treatment may be considered for patients with moderate symptoms of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

In the absence of evidence for or against any specific treatment, it is the work group’s recommendation that medical/interventional treatment be considered for patients with mild symptoms of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

There is insufficient evidence at this time to make a recommendation for or against the placement of an interspinous process spacing device in patients with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Decompression alone is suggested for patients with leg predominant symptoms without instability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	91%
Use in the appropriate context:	Yes
Comments:	None

Surgical treatment may be considered to provide long term (>4 years) improvement in patients with degenerative lumbar spinal stenosis and has been shown to improve outcomes in a large percentage of patients

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Surgical decompression may be considered in patients aged 75 years or older with lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

An evidence-based clinical guideline for antibiotic prophylaxis in spine surgery (North American Spine Society, 2013)

AGREE GRS: 4/6/6

Preoperative prophylactic antibiotics are suggested to decrease infection rates in patients undergoing spine surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For a typical uncomplicated lumbar laminotomy and discectomy, a single preoperative dose of antibiotics is suggested to decrease the risk of infection and/or discitis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Prophylactic antibiotics are suggested to decrease the rate of spinal infections after non-instrumented lumbar spinal surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Prophylactic antibiotics may be considered to decrease the rate of infections after instrumented spine fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Preoperative antibiotic prophylaxis is suggested to decrease infection rates in patients undergoing spine surgery. In typical uncomplicated spinal procedures, the superiority of one agent, dose or route of administration over any other has not been clearly demonstrated. When determining the appropriate drug choice, the patient's risk factors, allergies, length and complexity of the procedure, and issues of antibiotic resistance should be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In typical uncomplicated spinal procedures, a single dose of preoperative prophylactic antibiotics with intraoperative redosing as needed is suggested.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In patients with comorbidities or for those undergoing complicated spine surgery, alternative prophylactic regimens, including redosing, gram-negative coverage or the addition of intrawound application of vancomycin or gentamicin, are suggested to decrease the incidence of surgical site infections compared with standard prophylaxis regimens.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Resources, geographical

Preoperative antibiotic prophylaxis is suggested to decrease infection rates in patients undergoing spine surgery without spinal implants. In these typical uncomplicated spinal procedures, the superiority of one agent, dose or route of administration over any other has not been clearly demonstrated. When determining the appropriate drug choice, the patient's risk factors, allergies, length and complexity of the procedure and issues of antibiotic resistance should be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In typical uncomplicated open spine surgery without spinal implants, a single dose of preoperative prophylactic antibiotics with intraoperative redosing as needed is suggested.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Preoperative antibiotic prophylaxis is suggested to decrease infection rates in patients undergoing spine surgery with spinal implants. In these complex spinal procedures, the superiority of one agent, dose or route of administration over any other has not been clearly demonstrated. When determining the appropriate drug choice, the patient's risk factors, allergies, length and complexity of the procedure and issues of antibiotic resistance should be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with risk factors for polymicrobial infection, appropriate broad-spectrum antibiotics are suggested to decrease the risk of infection when instrumented fusion is performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Simple uncomplicated spine surgery (without instrumentation or comorbidities): one single preoperative dose of antibiotic of choice with intraoperative redosing as needed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Instrumented spine surgery, prolonged procedures, comorbidities: one single preoperative dose of antibiotic of choice plus consideration of additional gram-negative coverage and/or the application of intrawound vancomycin or gentamicin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Resources, geographical

Intraoperative redosing within 3 to 4 hours may be considered to maintain therapeutic antibiotic levels throughout the procedure. The superiority of one drug has not been demonstrated in the literature. When determining the appropriate drug choice, the patient's risk factors, allergies, length and complexity of the procedure, and issues of antibiotic resistance should be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

For typical uncomplicated cases, a single dose of preoperative prophylactic antibiotics with intraoperative redosing as needed is suggested to decrease the risk of surgical site infection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Prolonged postoperative regimens may be considered in complex situations. Comorbidities and complex situations reviewed in the literature include obesity, diabetes, neurologic deficits, incontinence, preoperative serum glucose level of >125 mg/dL or a postoperative serum glucose level of >200 mg/dL, trauma, prolonged multilevel instrumented surgery and other comorbidities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is insufficient evidence to make a recommendation for or against the early discontinuation of antibiotic prophylaxis in patients with wound drains.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The use of drains is not recommended as a means to reduce infection rates after single-level surgical procedures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Obese patients are at higher risk for postoperative infection, when given a standardized dose of antibiotic prophylaxis. In spite of this conclusion, there is insufficient evidence to make a recommendation for or against recommending a different protocol for patients based on body habitus.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

In patients with comorbidities or for those undergoing complicated spine surgery, alternative prophylactic regimens are suggested to decrease the incidence of surgical site infections compared with standard prophylaxis regimens.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is insufficient evidence to make a recommendation for or against the specific alternative regimens that are efficacious. However, promising alternative regimens that have been studied include redosing, gram-negative coverage and the addition of intrawound application of vancomycin or gentamicin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the prophylactic use of vancomycin compared with other antimicrobial agents to reduce infections with MRSA.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations (American Society of Interventional Pain Physicians, 2013)

AGREE GRS: 6/5/5

Diagnostic selective nerve root blocks may be recommended with limited evidence in the lumbar spine in patients with an equivocal diagnosis and involvement of multiple levels.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

The recommendations for lumbar provocation discography include appropriate indications with patients with low back pain to prove the diagnostic hypothesis of the discogenic pain specifically after exclusion of other sources of lumbar pain, only when a treatment is available.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	53%
Use in the appropriate context:	No
Comments:	Insufficient evidence, risk

The evidence is good for caudal epidural, interlaminar epidural and transforaminal epidural injections with or without steroids in managing disc herniation or radiculitis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

For axial or discogenic pain, the evidence is fair for either caudal epidural or lumbar interlaminar epidural injections with or without steroids. The evidence is limited for transforaminal epidural injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low to moderate quality

For spinal stenosis, the evidence is fair for caudal and interlaminar injections and limited for transforaminal epidural injections with or without steroids.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low to moderate quality

For post-surgery syndrome, the evidence is fair for caudal epidural injections with or without steroids.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality

For disc herniation, one of the three approaches may be used: lumbar interlaminar, caudal epidural or transforaminal injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

For axial or discogenic pain, either lumbar interlaminar or caudal epidural injections are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

For spinal stenosis, one of the three approaches may be used: lumbar interlaminar, caudal epidural or transforaminal injections. However with transforaminal, there is limited evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

For post-surgery syndrome, the preferred modality of treatment is with caudal epidural with or without steroids.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Percutaneous adhesiolysis is recommended in patients with post lumbar surgery syndrome and lumbar central spinal stenosis after failure of conservative management of physical therapy, chiropractic, drug therapy, structured exercise program and fluoroscopically directed epidural injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Intradiscal electrothermal therapy and biaculoplasty may be performed in a select group of patients with discogenic pain nonresponsive to conservative modalities including epidural injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence, risk

Even though automated percutaneous lumbar discectomy and percutaneous lumbar laser disc decompression have been around for a long time and have been performed in a large proportion of patients, due to the lack of randomized trials, the evidence continues to be limited. Based on individual experience and large amount of literature, this may be performed when indicated. In contrast, among the 2 newly emerging procedures, nucleoplasty is with limited to fair evidence. Finally, DeKompressor is with limited evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence, risk

Based on the present comprehensive evaluation, the evidence is good for accuracy. Diagnostic lumbar facet joint nerve blocks are recommended in patients with suspected facet joint pain

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Based on the available evidence it appears that the best response is obtained after confirmation of the diagnosis of facet joint pain with controlled diagnostic blocks, preferably with 75% pain relief as the criterion standard with dual blocks. Based on the present evidence, there is good evidence for conventional radiofrequency neurotomy and fair to good evidence for lumbar facet joint nerve blocks for the treatment of chronic lumbar facet joint pain both in short-term and long-term. However, the evidence is limited for intraarticular facet joint injections and pulsed radiofrequency thermoneurolysis. Consequently, the recommended treatment is with radiofrequency neurotomy or therapeutic facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Controlled sacroiliac joint blocks with placebo or controlled comparative local anaesthetic blocks are recommended when indications are satisfied with suspicion of sacroiliac joint pain, except when required by regulation or guidance, a positive response is considered $\geq 75\%$ relief (good evidence) or with ability to perform previously painful movements.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Based on the comprehensive review of the literature, there is good evidence that diagnostic blockade with controlled blocks provides better selection criteria than without diagnostic blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Based on the comprehensive review of the literature for therapeutic purposes, the only effective modality with fair evidence appears to be cooled radiofrequency neurotomy after appropriate diagnosis confirmed by diagnostic sacroiliac joint injections. However, evidence is emerging for intraarticular injections, even though it is limited at the present time, which may be used in selected cases with or without periarticular injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Cervical discography is indicated only when a treatment is available to test the diagnostic hypothesis of discogenic pain of the cervical spine in individuals who have been properly selected and screened to eliminate other sources of cervical pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Limited evidence, risk

There is good evidence for disc herniation and fair evidence for axial or discogenic pain, central spinal stenosis and post cervical surgery syndrome. Cervical interlaminar epidural injections are indicated for these conditions with appropriate indications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Diagnostic cervical facet joint nerve blocks are recommended in patients with somatic or non-radicular neck pain or headache and upper extremity pain, with duration of pain of at least 3 months, without preponderance of evidence of discogenic pain, disc herniation, or evidence of radiculitis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Based on the available evidence, there is fair evidence for conventional radiofrequency neurotomy and therapeutic facet joint nerve blocks with limited evidence for intra-articular injections cervically. Consequently, the recommendation is that therapeutic facet joint nerve blocks or conventional radiofrequency neurotomy may be provided based on the response from controlled diagnostic blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

If the indication is appropriate and a treatment is available, thoracic discography can be performed to diagnose thoracic discogenic disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Limited evidence, risk

Thoracic epidural injections are recommended for thoracic discogenic, disc-related, post-surgery syndrome or spinal stenosis pain with fair albeit rather weak evidence and based on only one randomized preliminary controlled trial.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	56%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Diagnostic thoracic facet joint nerve blocks are indicated in patients with somatic or non-radicular upper back or mid back pain, with lack of obvious evidence for discogenic pain, disc herniation or evidence of radiculitis. Based on the present evidence it also appears that criterion standard of controlled diagnostic blocks with 75% pain relief is essential.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

There is fair evidence that thoracic facet joint pain confirmed by controlled diagnostic blocks may be treated with therapeutic medial branch blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Spinal cord stimulation is indicated in chronic low back pain with lower extremity pain secondary to failed back surgery syndrome, after exhausting multiple conservative and interventional modalities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Intrathecal infusion systems are indicated in recalcitrant non-cancer pain with post-surgery syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence, risk

Evidence-based clinical guidelines for multidisciplinary spine care: diagnosis and treatment of degenerative lumbar spondylolisthesis (North American Spine Society, 2014)

AGREE GRS: 6/5/5

It is the work group's opinion that obtaining an accurate history and physical examination is important for the diagnosis and treatment of patients with degenerative lumbar spondylolisthesis. Formulating appropriate clinical questions is essential to obtaining an accurate history that can be used in developing a treatment plan for patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The lateral radiograph is the most appropriate, non-invasive test for detecting degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In the absence of reliable evidence, it is the work group's opinion that the lateral radiograph should be obtained in the standing position whenever possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	Good practice

The most appropriate, non-invasive test for imaging stenosis accompanying degenerative lumbar spondylolisthesis is MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Facet joint effusion greater than 1.5 mm on supine MRI may be suggestive of the presence of degenerative lumbar spondylolisthesis. Further evaluation for the presence of degenerative lumbar spondylolisthesis should be considered, including using plain standing radiographs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is insufficient evidence to make a recommendation for or against the utility of the upright seated MRI in the diagnosis of degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the use of axial loaded MRI to evaluate the dural sac cross sectional area in patients with degenerative lumbar spondylolisthesis and spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Plain myelography or CT myelography are useful studies to assess spinal stenosis in patients with degenerative lumbar spondylolisthesis especially in those who have contraindications to MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

In patients with degenerative lumbar spondylolisthesis with associated spinal stenosis for whom MRI is either contraindicated or inconclusive, CT myelography is the most appropriate test to confirm the presence of anatomic narrowing of the spinal canal or the presence of nerve root impingement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

In patients with degenerative spondylolisthesis with associated spinal stenosis for whom MRI and CT myelography are contraindicated, inconclusive or inappropriate, CT is suggested as the most appropriate test to confirm the presence of anatomic narrowing of the spinal canal or the presence of nerve root impingement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to make a recommendation on the most appropriate diagnostic or physical exam test consistent with fixed or dynamic deformity in degenerative lumbar spondylolisthesis patients due to the lack of uniform reference standards which define instability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is no universally accepted standard to diagnose fixed versus dynamic spondylolisthesis. To evaluate instability, many studies employ the use of lateral flexion extension radiographs, which may be done in the standing or recumbent position; however, there is wide variation in the definition of instability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

There is insufficient evidence to make a recommendation for or against the utility of dynamic MRI and dynamic CT myelography in the diagnosis of degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the use of injections for the treatment of degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Medical/interventional treatment for degenerative lumbar spondylolisthesis, when the radicular symptoms of stenosis predominate, most logically should be similar to treatment for symptomatic degenerative lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Direct surgical decompression may be considered for the treatment of patients with symptomatic spinal stenosis associated with low grade degenerative lumbar spondylolisthesis whose symptoms have been recalcitrant to a trial of medical/interventional treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to make a recommendation for or against the use of indirect surgical decompression for the treatment of patients with symptomatic spinal stenosis associated with low grade degenerative lumbar spondylolisthesis whose symptoms have been recalcitrant to a trial of medical/interventional treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Surgical decompression with fusion is suggested for the treatment of patients with symptomatic spinal stenosis and degenerative lumbar spondylolisthesis to improve clinical outcomes compared with decompression alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes
Comments:	Outdated, individual

For symptomatic single level degenerative spondylolisthesis that is low-grade (<20%) and without lateral foraminal stenosis, decompression alone with preservation of midline structures provides equivalent outcomes when compared to surgical decompression with fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Surgical decompression with fusion, with or without instrumentation, is suggested to improve the functional outcomes of single-level degenerative spondylolisthesis compared to medical/interventional treatment alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

There is insufficient evidence to make a recommendation for or against efficacy of surgical decompression with fusion, with or without instrumentation, for treatment of multi-level degenerative lumbar spondylolisthesis compared to medical/interventional treatment alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The addition of instrumentation is suggested to improve fusion rates in patients with symptomatic spinal stenosis and degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

The addition of instrumentation is not suggested to improve clinical outcomes for the treatment of patients with symptomatic spinal stenosis and degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to make a recommendation for or against the use of either decompression with posterolateral fusion or 360° fusion in the surgical treatment of patients with degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient and conflicting evidence to make a recommendation for or against the efficacy of interspinous spacers versus medical/interventional treatment in the management of degenerative lumbar spondylolisthesis patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Conflicting evidence

There is insufficient evidence to make a recommendation for or against the use of reduction with fusion in the treatment of degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the use of autogenous bone graft or bone graft substitutes in patients undergoing posterolateral fusion for the surgical treatment of degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

While both minimally invasive techniques and open decompression and fusion, with or without instrumentation, demonstrate significantly improved clinical outcomes for the surgical treatment of degenerative lumbar spondylolisthesis, there is conflicting evidence which technique leads to better outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Outdated, individual

Decompression and fusion may be considered as a means to provide satisfactory long-term results for the treatment of patients with symptomatic spinal stenosis and degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Individual assessment

There is insufficient evidence to make a recommendation for or against the influence of a nonorganic pain drawing on the outcomes/prognosis of treatments for patients with degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation regarding the influence of age and three or more comorbidities on the outcomes of patients undergoing treatment for degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation regarding the influence of symptom duration on the treatment outcomes of patients with degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation regarding the influence of obesity (BMI >30) and its impact on treatment outcomes in patients with degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to make a recommendation for or against the cost effectiveness of minimal access-based surgical treatments compared to traditional open surgical treatments for degenerative lumbar spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: Assessment of functional outcome following lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/6/6

It is recommended that when assessing functional outcome in patients treated for low-back pain due to degenerative disease, a reliable, valid and responsive outcomes instrument, such as the disease-specific Oswestry Disability Index, be used.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	93%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that when assessing general health-related quality of life in patients treated for low back pain due to degenerative disease that a reliable, valid and responsive outcomes instrument, such as the 36-Item Short Form Health Survey, be used.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that the minimum clinically important difference be considered when assessing clinical outcome.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	91%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 3: Assessment of economic outcome (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

There is Level I evidence (single study) to recommend the use of a circumferential fusion (ALIF + posterolateral fusion) as a more cost-effective option (over an 8-year time period) than stand-alone posterolateral fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is Level I evidence (single study) to recommend either total lumbar disc replacement or lumbar fusion from an economic perspective for the treatment of selected patients with chronic low back pain (over a 2-year time period).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes
Comments:	Limited evidence, individual

With respect to the combination of anterior lumbar interbody fusion (ALIF) plus posterolateral fusion, there is Level II evidence that the use of a femoral ring allograft for interbody fusion is a more cost-effective interbody option than the use of a specific titanium cage.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

From an economic perspective, both iliac crest bone graft and recombinant human bone morphogenetic protein–2 are posterolateral fusion graft options in patients over the age of 60.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

From an economic perspective, both minimally invasive and open transforaminal lumbar interbody fusion (TLIF) techniques are options when treating patients with symptomatic Grade I degenerative spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

There are conflicting data regarding the cost-effectiveness of cell-salvage auto-transfusion as an adjunct to lumbar fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Conflicting evidence

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 4: Radiographic assessment of fusion status (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/6/6

Following lumbar fusion surgery, static lumbar radiographs are not recommended as a stand-alone method to assess fusion status.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Following instrumented posterolateral lumbar fusions, CT imaging with fine-cut axial and multi planar reconstruction views is recommended as a method to assess fusion status. When bilateral posterolateral intertransverse bridging bone is observed on CT scans, the presence of solid fusion is strongly suggested. For the determination of pseudarthrosis, the absence of bilateral facet fusion is more suggestive of true non-union than the absence of posterolateral lumbar fusion..

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Following ALIF with cage instrumentation, CT imaging with fine-cut axial and multiplanar reconstruction views is recommended as a method to assess fusion status. In this setting, the demonstration of bridging bone posterior to the cage (posterior sentinel sign) on CT scans correlates with the presence of solid fusion with a consensus of raters, but intra-observer variability limits the generalizability of a single rater assessment. The presence of bridging bone anterior to the cage (anterior sentinel sign) also correlates with fusion, with higher specificity but lower sensitivity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	81%
Use in the appropriate context:	Yes
Comments:	None

Following non-instrumented lumbar fusion surgery, when non-invasive assessment of fusion status is desired, lateral flexion and extension lumbar radiographs are recommended. The lack of significant motion between vertebrae is highly suggestive of successful fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Technetium-99 bone scanning is not recommended as a reliable method to assess fusion status following lumbar fusion surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Several radiographic techniques such as static radiography, lateral flexion-extension radiography and CT imaging, often in combination, are recommended as options for the non-invasive evaluation of suspected symptomatic lumbar pseudarthrosis. However, the sensitivity and specificity of these non-invasive radiographic tests are imperfect. The specific type of fusion and/or instrumentation surgery, patient characteristics, and clinical scenario can influence the choice of modalities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Guidelines for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: correlation between radiographic and functional outcome (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/6/6

When performing lumbar arthrodesis for degenerative lumbar disease, strategies to achieve successful radiographic fusion should be considered, as there appears to be a correlation between successful fusion and improved clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 6: Discography for patient selection (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/4/5

It is recommended that a discal block be considered as a diagnostic option during the evaluation of a patient presenting with chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Limited evidence, risk

It is recommended that lumbar discography not be used as a stand-alone test on which treatment decisions are based for patients with low-back pain with abnormal imaging studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

It is recommended that within the discussion of potential risks for patients undergoing provocative discography, the potential for acceleration of the degenerative process be included as there is evidence to suggest an association between advanced degenerative spondylosis and a history of undergoing provocative discography.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	81%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 7: lumbar fusion for intractable low-back pain without stenosis or spondylolisthesis (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

Lumbar fusion or a comprehensive rehabilitation program incorporating cognitive therapy are recommended as treatment alternatives for patients with chronic low-back pain that is refractory to traditional conservative treatment, such as physical therapy, and is due to 1- or 2-level degenerative disc disease without stenosis or spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended that lumbar fusion be performed for patients whose low back pain is refractory to conservative treatment (physical therapy or other nonoperative measures) and is due to 1- or 2-level degenerative disc disease without stenosis or spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 8: Lumbar fusion for disc herniation and radiculopathy (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

Lumbar spinal fusion is not recommended as a routine treatment following primary disc excision in patients with isolated herniated lumbar discs causing radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Lumbar spinal fusion is a potential option in patients with herniated discs who have evidence of significant chronic axial back pain, work as manual labourers, have severe degenerative changes or have instability associated with radiculopathy caused by herniated lumbar discs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Re-operative discectomy and fusion is a treatment option in patients with recurrent disc herniations associated with instability or chronic axial low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 9: Lumbar fusion for stenosis with spondylolisthesis (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

Surgical decompression and fusion is recommended as an effective treatment alternative for symptomatic stenosis associated with a degenerative spondylolisthesis in patients who desire surgical treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Although there is insufficient evidence to recommend a standard fusion technique, the patient's anatomy, desires and concerns as well as surgeon experience should all be factored into the decision-making process when determining the optimal strategy for an individual patient to maximize fusion potential while minimizing risk of complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 10: lumbar fusion for stenosis without spondylolisthesis (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/6/6

Surgical decompression is recommended for patients with symptomatic neurogenic claudication due to lumbar stenosis without spondylolisthesis who elect to undergo surgical intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

In the absence of deformity or instability, lumbar fusion has not been shown to improve outcomes in patients with isolated stenosis, and therefore it is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	89%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 11: Interbody techniques for lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

The addition of an interbody fusion is recommended as an option to enhance the fusion rate (which lowers the reoperation rate) in patients undergoing lumbar fusion. However, the improvement in fusion rates with the addition of interbody fusion has not consistently translated to an improvement in clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

The addition of posterolateral lumbar fusion to interbody fusion is not recommended in patients undergoing lumbar interbody fusion since the evidence indicates no substantial clinical benefit but an increased rate of complications if a posterolateral lumbar fusion is added to an interbody fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

ALIF performed with a frozen femoral ring allograft has a lower pseudarthrosis rate than ALIF performed with a freeze dried femoral ring allograft for the treatment of degenerative disc disease with or without spondylolisthesis. However, the improved fusion rate did not affect clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

ALIF has better clinical outcomes and fewer perioperative morbidities than instrumented posterolateral lumbar fusion, although the fusion rate is similar between the 2 techniques.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 12: Pedicle screw fixation as an adjunct to posterolateral fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/6/6

Pedicle screw fixation is recommended when posterolateral lumbar fusion is used to manage low back pain in patients at high risk for pseudarthrosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	91%
Use in the appropriate context:	Yes
Comments:	None

Routine use of pedicle screw fixation as an adjunct to posterolateral lumbar fusion for patients with degenerative disc disease is an option. There is consistent evidence that the use of pedicle screws enhances the fusion rate; however, a positive correlation with respect to clinical outcome has not been consistently demonstrated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 13: Injection therapies, low-back pain, and lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

Lumbar epidural steroid injections are an option for the short-term relief of chronic low-back pain without radiculopathy in patients with degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Caudal epidural steroid injections are an option for decreasing low-back pain of greater than 6 weeks' duration, without radiculopathy, in patients with degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Intra-articular injections of lumbar facet joints are not suggested for the treatment of facet-mediated chronic low-back pain without radiculopathy in cases of degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Lumbar medial nerve blocks are suggested for the short-term relief of facet-mediated chronic low-back pain without radiculopathy in patients with degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Lumbar medial nerve ablation is suggested for the short-term (3- to 6-month) relief of facet-mediated pain in patients who have chronic lower-back pain without radiculopathy from degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Trigger point injections performed as dry needling, with anaesthetics alone or with steroids, are not recommended in patients with chronic low-back pain without radiculopathy from degenerative disease of the lumbar spine because a long-lasting benefit has not been demonstrated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

To establish the diagnosis of lumbar facet-mediated pain, the double-injection technique with an improvement threshold of 80% or greater is suggested.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

Diagnostic facet blocks by the double-injection technique with an improvement threshold of 80% are an option for predicting a favourable response to facet medial nerve ablation by thermocoagulation for facet-mediated chronic low-back pain without radiculopathy in patients with degenerative disease of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence to support the use of diagnostic facet blocks as a predictor of lumbar fusion outcome in patients with chronic low-back pain from degenerative lumbar disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 14: Brace therapy as an adjunct to or substitute for lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/4/5

The prescription of a lumbar brace is useful for the secondary prevention of low back pain by reducing the number of days of self-reported low-back pain and days lost to work in labourers with a history of low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	53%
Use in the appropriate context:	No
Comments:	Outdated

For primary prevention, the use of a lumbar corset does not prevent the development of low-back pain in the general working population.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

For patients presenting with low-back pain, the prescription of a lumbar support in the setting of subacute pain (< 6 months duration) reduced the VAS pain score and medication usage and improved functional disability at 30–90 days.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of a brace following instrumented posterolateral lumbar fusion for lumbar spondylosis is not supported due to equivalent outcomes with and without bracing.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

A trial of preoperative bracing is not predictive of outcome for lumbar fusion in the setting of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 15: Electrophysiological monitoring and lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/3/4

The use of direct screw stimulation evoked EMG responses, as a diagnostic modality during lumbar fusion surgery, is an option since evidence suggests that EMG monitoring can be highly sensitive in detecting breaches of the pedicle

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, resources

The data are insufficient to support a recommendation regarding the use of neuromonitoring as a modality that can be used for the preservation of nerve root function during lumbar fusion surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 16: Bone graft extenders and substitutes as an adjunct for lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/5/5

The use of demineralized bone matrix as a bone graft extender is an option for 1- and 2-level instrumented posterolateral fusions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of β -tricalcium phosphate/local autograft as a substitute for autologous iliac crest bone is an option for single-level instrumented posterolateral fusion due to comparable fusion rates and clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of local autograft/bone marrow aspirate as a substitute for autologous iliac crest bone is an option for instrumented posterolateral fusion due to comparable fusion rates and clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of hydroxyapatite can be considered an option as a graft extender when mixed with autologous iliac crest bone for instrumented posterolateral fusions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of calcium sulphate preparations mixed with local autograft, as a substitute for autologous iliac crest bone, is an option for instrumented posterolateral fusions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

There is insufficient evidence to recommend for or against the use of a hydroxyapatite-glass/bone marrow aspirate composite as an autograft substitute for posterolateral fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The use of recombinant human bone morphogenetic protein-2 as a substitute for autologous iliac crest bone for ALIF with threaded interbody cages is an option due to similar fusion rates and clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	87%
Use in the appropriate context:	Yes
Comments:	None

The use of recombinant human bone morphogenetic protein-2 as a substitute for autologous iliac crest bone for single-level posterior lumbar interbody fusion (PLIF) is an option due to similar fusion rates and clinical outcomes; however, formation of heterotopic bone has been observed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Risk of heterotopic ossification

The use of recombinant human bone morphogenetic protein-2 as a bone graft extender can be considered as an option when performing a TLIF procedure with a structural interbody graft.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to make a recommendation regarding the use of recombinant human bone morphogenetic protein-2 as a supplement for stand-alone ALIF procedures using femoral ring allograft or with a resorbable spacer when performing TLIF procedures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The use of recombinant human bone morphogenetic protein-2 supplemented with 15% hydroxyapatite /85% β -tricalcium phosphate matrix as a substitute for autologous iliac crest bone is an option in single-level posterolateral instrumented fusions given the consistent observation of comparable fusion rate and clinical outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of recombinant human bone morphogenetic protein-2 supplemented with graft extenders as an alternative to autologous iliac crest bone is an option for single-level, instrumented posterolateral fusions in patients older than 60 years.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The use of recombinant human bone morphogenetic protein-2 as a graft extender with either autologous iliac crest bone or local bone is an option in patients undergoing either instrumented or non-instrumented posterolateral fusions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to formulate a recommendation regarding the use of recombinant human bone morphogenetic protein-2/local bone as a substitute for autologous iliac crest bone when performing revision posterolateral fusions or the use of recombinant human bone morphogenetic protein-2/calcium-based extenders for single level posterolateral fusions in patients who smoke and elect to undergo surgery for lumbar spondylosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The use of recombinant human bone morphogenetic protein-2 as a graft option has been associated with a unique constellation of complications that the surgeon should be aware of when considering the use of this graft extender/substitute.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	91%
Use in the appropriate context:	Yes
Comments:	None

The use of recombinant human bone morphogenetic protein-7 when combined with local autograft as an alternative to autologous iliac crest bone/local autograft is an option for single-level instrumented fusions based on equivalent clinical and radiographic outcomes. The use of recombinant human bone morphogenetic protein-7 has not been approved by the Food and Drug Administration for spinal fusions and currently requires a humanitarian device exemption.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Regulatory; Geographical

No recommendation regarding the use of recombinant human bone morphogenetic protein-7/absorbable collagen sponge as a substitute for autologous iliac crest bone in posterolateral fusions can be made due to conflicting evidence from studies of equal strength.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Conflicting evidence

Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 17: Bone growth stimulators as an adjunct for lumbar fusion (American Association of Neurological Surgeons & Congress of Neurological Surgeons, 2014)

AGREE GRS: 6/4/5

The routine use of direct current stimulation in patients over the age of 60 years is not recommended, as the evidence demonstrates no impact on fusion rates.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Insufficient impact

For patients younger than 60 years of age, undergoing a lumbar fusion, the use of direct current stimulation is an option as studies have demonstrated a positive impact on fusion rate; however, there is insufficient evidence regarding its impact on clinical outcome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is insufficient evidence to recommend for or against the use of pulsed electromagnetic field stimulation as a treatment alternative to revision surgery in patients presenting with pseudarthrosis following posterior lumbar fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Non-invasive treatments for acute, subacute and chronic low back pain: A clinical practice guideline from the American College of Physicians (American College of Physicians, 2017)

AGREE GRS: 6/5/5

Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat, massage, acupuncture or spinal manipulation. If pharmacologic treatment is desired, clinicians and patients should select NSAID or skeletal muscle relaxants.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low to moderate quality

For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction, tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioural therapy or spinal manipulation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low to moderate quality

In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with NSAIDs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

A clinical practice guideline for the management of patients with degenerative cervical myelopathy: recommendations for patients with mild, moderate, and severe disease and nonmyelopathic patients with evidence of cord compression (AO Spine North America & Cervical Spine Research Society, 2017)

AGREE GRS: 6/5/5

We recommend surgical intervention for patients with severe degenerative cervical myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We recommend surgical intervention for patients with moderate degenerative cervical myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

We suggest offering surgical intervention or a supervised trial of structured rehabilitation for patients with mild degenerative cervical myelopathy. If initial nonoperative management is pursued, we recommend operative intervention if there is neurological deterioration and suggest operative intervention if the patient fails to improve.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

We suggest not offering prophylactic surgery for non-myelopathic patients with evidence of cervical cord compression without signs or symptoms of radiculopathy. We suggest that these patients be counselled as to potential risks of progression, educated about relevant signs and symptoms of myelopathy and be followed clinically.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

Non-myelopathic patients with cord compression and clinical evidence of radiculopathy with or without electrophysiological confirmation are at a higher risk of developing myelopathy and should be counselled about this risk. We suggest offering either surgical intervention or nonoperative treatment consisting of close serial follow-up or a supervised trial of structured rehabilitation. In the event of myelopathic development, the patient should be managed according to the recommendations above.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

The MIST guidelines: The lumbar spinal stenosis consensus group guidelines for Minimally Invasive Spine Treatment (Lumbar Spinal Stenosis Consensus Group, 2018)

AGREE GRS: 4/5/4

The lumbar spinal stenosis treatment choice is dependent on the degree, level and architecture of the stenosis; severity of the symptoms; failed, past, less invasive treatments; and patient comorbidities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There are poor correlations between severity of spinal stenosis radiographically and clinical presentation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

When possible, an interpretation of the MRI by the treating physician performing either a direct or indirect surgical decompressive procedure is critical to improve success, avoid failure and improve safety.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Symptomatic lumbar spinal stenosis is a diagnosis that requires both radiographic evidence and presence of neurogenic claudication symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Neurogenic claudication needs to be differentiated from other claudication sources.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

There is low-quality evidence for using NSAIDs, neuropathic pain medications and opioids as monotherapy in the treatment of spinal stenosis. These therapies should be employed judiciously, balancing the patient's individual risks and benefits.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is little evidence supporting the use of axial bracing for the treatment of neurogenic claudication and spinal stenosis. If instability is suspected, bracing may be helpful in the treatment of neurogenic claudication related to spinal segmental motion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated, risk-benefit

When performing spinal interventional treatments, it is imperative to follow the described anticoagulation recommendations and to ensure that detection of injury can occur by either maintaining a reactive patient or the use of appropriate neurological monitoring.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

There is ample evidence to support the use of minimally invasive treatment strategies for the management of symptomatic lumbar spinal stenosis. Depending on the

duration and extent of relief, these minimally invasive options can be repeated or continued to more surgical treatment solutions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Based on the systematic review of the available literature for percutaneous image-guided lumbar decompression, the consensus committee has determined that there is sufficient support to warrant Level I evidence. The 2 comparative prospective studies that led to reimbursement approval by the Centres for Medicare & Medicaid Services are both Level I. All Randomized Controlled trial (RCT) evidence compares percutaneous image-guided lumbar decompression to lumbar epidural steroid injection and not to open decompression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Very low quality evidence

Based on the independent systematic review of the available literature for spacers placed by interventional pain physicians and interventional radiologists, the consensus committee has determined that there is sufficient support to warrant Level I evidence. The recommendation is based on an RCT noninferiority study of 2 spacers and not comparing spacers to open decompression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Very low quality evidence

VA/DoD clinical practice guideline: Diagnosis and treatment of low back pain (Department of Veterans Affairs & Department of Defence, 2019)

AGREE GRS: 5/5/5

For patients with low back pain, we recommend that clinicians conduct a history and physical examination, that should include identifying and evaluating neurologic deficits (e.g. radiculopathy, neurogenic claudication), red flag symptoms associated with serious underlying pathology (e.g. malignancy, fracture, infection), and psychosocial factors.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with low back pain, we suggest performing a mental health screening as part of the low back pain evaluation and taking results into consideration during selection of treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with acute axial low back pain (i.e., localized, non-radiating), we recommend against routinely obtaining imaging studies or invasive diagnostic tests.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with low back pain, we recommend diagnostic imaging and appropriate laboratory testing when neurologic deficits are serious or progressive or when red flag symptoms are present.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with low back pain greater than 1 month who have not improved or responded to initial treatments, there is inconclusive evidence to recommend for or against any diagnostic imaging.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For patients with chronic low back pain, we recommend providing evidence-based information with regard to their expected course, advising patients to remain active, and providing information about self-care options.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with chronic low back pain, we suggest adding a structured education component, including pain neurophysiology, as part of a multicomponent self-management intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with chronic low back pain, we recommend cognitive behavioural therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with chronic low back pain, we suggest mindfulness-based stress reduction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with acute low back pain, there is insufficient evidence to support the use of specific clinician-directed exercise.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For patients with chronic low back pain, we suggest offering clinician-directed exercises.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with acute or chronic low back pain, we suggest offering spinal mobilization/manipulation as part of a multimodal program.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

For patients with acute low back pain, there is insufficient evidence to support the use of acupuncture.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For patients with chronic low back pain, we suggest offering acupuncture.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For acute or chronic low back pain, there is insufficient evidence for or against the use of lumbar supports.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For patients with chronic low back pain, we suggest offering an exercise program, which may include pilates, yoga, and tai chi.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

For patients with low back pain, there is insufficient evidence to support the use of ultrasound.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with low back pain, there is inconclusive evidence to support the use of TENS.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with low back pain, there is insufficient evidence to support the use of lumbar traction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

For patients with low back pain, there is insufficient evidence to support the use of electrical muscle stimulation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with acute or chronic low back pain, we recommend treating with NSAIDs, with consideration of patient-specific risks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with chronic low back pain, we suggest offering treatment with duloxetine, with consideration of patient-specific risks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with acute low back pain or acute exacerbations of chronic low back pain, we suggest offering a non-benzodiazepine muscle relaxant for short-term use.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with chronic low back pain, we suggest against offering a non-benzodiazepine muscle relaxant.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with low back pain, we recommend against benzodiazepines.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with acute or chronic low back pain with or without radiculopathy, we recommend against the use of systemic corticosteroids (oral or intramuscular injection).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

For patients with low back pain, we recommend against initiating long-term opioid therapy. For patients who are already prescribed long-term opioid therapy, refer to the VA/DoD CPG for the Management of Opioid Therapy for Chronic Pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with acute low back pain or acute exacerbations of chronic low back pain, there is insufficient evidence to recommend for or against the use of time-limited opioid therapy. Given the significant risks and potential benefits of opioid therapy, patients should be evaluated individually, including consideration of psychosocial risks and alternative non-opioid treatments. Any opioid therapy should be kept to the shortest duration and lowest dose possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

For patients with acute or chronic low back pain, there is insufficient evidence to recommend for or against the use of time-limited (less than 7 days) acetaminophen therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For patients with chronic low back pain, we recommend against the chronic use of oral acetaminophen.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For the treatment of acute or chronic low back pain, including patients with both radicular and non-radicular low back pain, there is insufficient evidence to recommend for or against the use of antiepileptics including gabapentin and pregabalin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For the treatment of low back pain, there is insufficient evidence to recommend for or against the use of topical preparations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For the treatment of low back pain, there is insufficient evidence to recommend for or against nutritional, herbal, and homeopathic supplements.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For the long-term reduction of radicular low back pain, non-radicular low back pain, or spinal stenosis, we recommend against offering spinal epidural steroid injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For the very short-term effect (less than or equal to 2 weeks) of reduction of radicular low back pain, we suggest offering epidural steroid injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For the treatment of low back pain, we suggest against offering intra-articular facet joint steroid injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with low back pain, there is inconclusive evidence to recommend for or against medial branch blocks and radiofrequency ablative denervation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Conflicting evidence

For selected patients with chronic low back pain not satisfactorily responding to more limited approaches, we suggest offering a multidisciplinary or interdisciplinary rehabilitation program which should include at least one physical component and at least one other component of the biopsychosocial model (psychological, social, occupational) used in an explicitly coordinated manner.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

ACOEM guidelines: Diagnostic tests for low back disorders (American College of Occupational and Environmental Medicine, 2020)

AGREE GRS: 6/5/5

Generally, MRI is superior for imaging soft tissue including intervertebral disc herniations. There are many additional diagnostic tests possible for the evaluation of low back pain and spinal conditions. In the absence of moderate- to high-quality studies, other tests are not recommended, insufficient evidence, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Functional capacity evaluations are a recommended option for evaluation of disabling chronic low back pain where the information may be helpful to attempt to objectify worker capability, function, motivation and effort vis-a-vis either a specific job or general job requirements, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

There is no recommendation for or against the use of functional capacity evaluations for chronic stable low back pain or after completion of postoperative recovery among those able to return to work. No recommendation, insufficient evidence, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Functional capacity evaluations are not recommended for evaluation of acute low back pain, acute or subacute radicular syndromes, or postsurgical back pain problems within the first 12 weeks of the postoperative period. Not recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Insufficient, individual

In general, routine x-ray is not recommended for acute nonspecific low back pain. Moderately not recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

Routine x-ray is recommended in the setting of red flags where the acute low back pain could be due to fracture, neoplasia, infection or systemic illness, where subacute or chronic low back pain is not improved as a means of ruling out other conditions. Recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

Flexion and extension views are recommended for evaluating symptomatic spondylolisthesis (chronic, severe mechanical pain suspected as an instability), in which there is consideration for surgery or other invasive treatment or occasionally in the setting of trauma. Recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There are currently no quality studies on which to recommend standing MRI for uses outside of research settings, and interpretation of normal findings of increased disc bulging with standing are unclear, therefore standing or weight bearing MRI is not recommended for back or radicular pain syndrome conditions. Not Recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Research

MRI is recommended for patients with acute low back pain during the first 6 weeks for evaluating progressive neurologic deficit, cauda equina syndrome, history of neoplasia (cancer), persistent fever plus elevated erythrocyte sedimentation rate without other infectious source or atypical presentation, for example, clinical picture suggests multiple nerve root involvement. Recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Repeat MRI imaging without significant clinical change in symptoms and/or signs, such as development of neurological deficit, is also not recommended. Moderately not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In cases where an epidural corticosteroid injection is being considered for temporary relief of acute or subacute radiculopathy, MRI at 3 to 4 weeks (before the epidural steroid injection) may be reasonable. Moderately recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

MRI is recommended for selecting chronic low back pain patients to rule out concurrent pathology unrelated to injury. This is not recommended before 3 months and only after other treatment modalities (including NSAIDs, aerobic exercise and directional preference exercises) have failed. Recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Routine CT is not recommended for acute, subacute or chronic nonspecific low back pain, or for radicular pain syndromes. Not recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If there is strong consideration for surgery, then CT myelography should be considered instead of CT alone. Recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Myelography is recommended in uncommon situations, such as contraindications for MRI such as implanted metal that preclude MRI, equivocal findings of disc herniation on MRI suspected of being false positives, spinal stenosis and/or a postsurgical situation that requires myelography. Recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Individual, resources

Aside from specific indications which involve a minority of low back pain patients, the routine use of bone scanning is not recommended in diagnosing low back pain. Not recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Single photon emission computed tomography (SPECT) is not currently recommended for low back pain and/or related disorders. Not recommended, insufficient evidence, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

Electrodiagnostic studies, which must include needle EMG, are recommended where a CT or MRI is equivocal and there is ongoing pain that raises questions about whether there may be a neurological compromise that may be identifiable (i.e. leg symptoms consistent with radiculopathy, spinal stenosis, peripheral neuropathy, etc.). Also, may be helpful for evaluation of chronicity and/or aggravation of a pre-existing problem. Moderately recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Electrodiagnostic studies are not recommended for patients with acute, subacute or chronic low back pain who do not have significant leg pain or numbness. Not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Electrodiagnostic studies are recommended for patients with subacute or chronic low back pain highly suspicious for lumbar spinal stenosis when MRI findings may be negative. Moderately recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There are four moderate-quality studies incorporated into this analysis and no quality evidence of diagnostic efficacy, and thus, surface EMG is not recommended to diagnose low back pain. Not recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is one high-and one moderate-quality study showing no diagnostic efficacy and thus, diagnostic ultrasound is not recommended for diagnosing low back pain. Not recommended, insufficient evidence, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There are no quality studies but two low quality studies using thermography, and in the absence of quality evidence of efficacy, thermography is not recommended for diagnosing acute, subacute or chronic low back pain or radicular pain. Not recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

There are no evidence-based indications for fluoroscopy and it is not recommended for evaluating acute, subacute or chronic low back pain. Not recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Video-fluoroscopy for the assessment of acute, subacute or chronic low back pain is not recommended. Not recommended, insufficient evidence, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Discography, either performed as a solitary test or when paired with imaging (e.g. MRI), is moderately not recommended for acute, subacute or chronic low back pain or radicular pain syndromes. Strongly not recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There are five moderate-quality studies incorporated, but no quality evidence showing discography with MRI improves outcomes with herniated discs, and, therefore, it is not recommended for evaluating herniated discs. Not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Myeloscopy is an invasive study with potential complications, is costly, without quality evidence of efficacy, and is not recommended for diagnosing acute, subacute or chronic low back pain spinal stenosis, radicular pain syndromes or postsurgical back pain. Not recommended, insufficient evidence, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

ACOEM guidelines: Non-invasive and minimally invasive management of low back disorders (American College of Occupational and Environmental Medicine, 2020)

AGREE GRS: 5/5/5

Maintaining maximal levels of activity, including work activities, is recommended as not returning to work has detrimental effects on pain ratings and functionality.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Activity guidelines are generally reassessed every week in the acute phase with gradual increases in activity recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Evidence supports that bed rest is not recommended for the management of acute, subacute, chronic and radicular low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Specific beds or other commercial sleep products are not recommended for prevention or treatment of acute, subacute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

Fear avoidance belief training is recommended for acute, subacute or chronic low back pain patients with elevated fear avoidance beliefs at baseline with or without referred pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Lordotic sitting posture is recommended for treatment of acute, subacute, or chronic low back pain, radicular pain and postoperative pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

A pillow or an existing feature of a motor vehicle seat is not invasive, has few adverse effects, is low cost and is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

As supportive quality evidence is lacking and absence of sleep is detrimental, sleep posture(s) that are most comfortable for the patient are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is no recommendation for or against specific mattresses, bedding and water beds.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

An exercise prescription is moderately recommended for acute, subacute, chronic, postoperative and radicular low back pain patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Aerobic exercises, most commonly a progressive walking program targeting either time or distance, are recommended for all patients from the initial appointment as follows: moderately recommended for acute and subacute low back pain, strongly recommended for chronic low back pain, recommended for radicular pain, recommended for postoperative patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Directional exercises which centralise or abolish the pain are recommended for acute low back pain, recommended for subacute, chronic and radicular low back pain all with moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Slump stretching exercises three to five times a day are an option and are recommended for acute low back pain, and recommended for subacute and chronic low back pain, all with low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Stretching exercises as an isolated low back pain prevention program are not recommended, low confidence, and there is a lack of evidence that generic, non-specific stretching exercises are of assistance in treating patients with acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Stretching exercises for treatment of chronic low back pain in the absence of significant range of motion deficits may result in lack of adherence to functional goals including aerobic and strengthening exercises and thus, are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Strengthening exercises are recommended, high confidence, for nearly all low back pain patients other than those with acute low back pain that resolves rapidly or acute low back pain in the early acute treatment phase when strengthening could aggravate the pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Specific strengthening exercises, such as stabilisation exercises, are also helpful for the prevention and treatment (including post operative treatment) of low back pain and thus are recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Abdominal strengthening exercises as a sole or central goal of a strengthening program for treatment or prevention of low back pain are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Aquatic therapy is recommended for select chronic low back pain and recommended, moderate confidence for subacute low back pain patients. Aquatic therapy is not recommended, moderate confidence, for all other subacute and chronic low back pain patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Lumbar extension machines are intended to address low back pain through the development of muscle strength in specific muscle groups through specific exercises, yet in the absence of quality evidence of efficacy, they are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Exercise aspects of yoga and tai chi for select, motivated patients with chronic low back pain are recommended and for acute and subacute low back pain patients, there is no recommendation, all with low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

There is no recommendation, low confidence, for treatment of low back pain with pilates as quality evidence is lacking.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

NSAIDs are strongly recommended, high confidence, for acute, chronic and radicular syndromes and moderately recommended, high confidence, for subacute and postoperative pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Acetaminophen is an acceptable alternative with some evidence of efficacy, but is inferior to NSAIDs and thus is recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Although gastrointestinal bleeding is rarely problematic in employed populations, when there is increased risk and as NSAIDs are superior, concomitant prescription of proton pump inhibitors are strongly recommended, sucralfate is moderately recommended and proton pump blockers are recommended, all with high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Aspirin or acetaminophen are recommended, high confidence, for those with known cardiovascular disease or multiple cardiovascular risks and the degree of cyclooxygenase-2 inhibition is believed to be related to cardiovascular risk among the NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Antibiotics (amoxicillin/clavulanate 500mg/125mg three times per day for 100 days) have been used in highly selective treatment of low back pain that includes Modic changes and bone oedema. Evidence conflicts. Accordingly, there is no recommendation, low confidence, for use in low back pain patients other than proven infection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Antidepressants have been widely utilized for the treatment of chronic low back pain and evidence suggests submaximal doses are generally effective. Norepinephrine blocking appears required for efficacy, and thus selective serotonin reuptake inhibitors, bupropion and trazodone are ineffective and strongly not recommended, moderate confidence, for chronic low back pain and not recommended for other low back pain syndromes

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Norepinephrine reuptake inhibitor antidepressants (e.g. tricyclic antidepressants - amitriptyline, imipramine, nortriptyline, desipramine, maprotiline, doxepin) and mixed serotonin norepinephrine reuptake inhibitors (e.g. duloxetine) are strongly recommended for chronic low back pain and recommended for acute and subacute pain, both with moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no recommendation, low confidence, for treatment with antidepressants of postoperative and radicular low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Anticonvulsants including gabapentin have evidence showing a lack of efficacy and thus they are not recommended, low confidence, for acute, subacute and chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Anticonvulsants, including gabapentin and pregabalin, are not recommended for chronic radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Topiramate is recommended, low confidence, for chronic low back pain patients with depression or anxiety although it is generally recommended after exercises and trials of NSAIDs and anti-depressants.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Gabapentin or pregabalin for perioperative pain management to reduce the need for opioids, particularly in patients with adverse effects from opioids, are efficacious and are strongly recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation, low confidence, for use of other anticonvulsants for perioperative management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Gabapentin is recommended, moderate confidence, for treatment of severe neurogenic claudication with limited walking distance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Bisphosphonates and calcitonin are not recommended, moderate confidence, for chronic low back pain management. However, they may have uses for osteoporosis management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Oral and intravenous colchicine are not recommended, moderate confidence for treatment of acute, subacute or chronic low back pain

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

There is no recommendation, low confidence, for or against use of thiocolchicoside for treatment of acute, subacute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Lidocaine patches are not recommended, moderate confidence, for treatment of chronic low back pain and there is no recommendation for other spine conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

There are no quality studies incorporated into the analysis of N-methyl-D aspartate receptor/antagonists. These medications including dextromethorphan are not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Opioids are strongly not recommended, high confidence, for treatment of non-severe pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Opioids are recommended, high confidence, for highly selective use to treat severe acute pain from severe injuries, and postoperative pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Muscle relaxants (not including carisoprodol) are moderately recommended, moderate confidence, as a second-line treatment in moderate to severe acute low back pain that has not been adequately controlled by NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Muscle relaxants are not recommended, moderate confidence, for treatment of acute mild to moderate low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

Muscle relaxants are selectively recommended, low confidence, for acute exacerbations of chronic low back pain or postoperative muscle spasm but otherwise are not recommended, low confidence, for treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Carisoprodol and diazepam are not recommended, low confidence, due to their abuse potential and lack of superiority to other muscle relaxants.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Systemic corticosteroids are recommended, moderate confidence, for treatment of acute and subacute radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no recommendation, moderate confidence, for treatment of chronic radicular pain syndromes with systemic corticosteroids.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Corticosteroids have been found to be ineffective for management of low back pain and thus they are moderately not recommended for acute low back pain and not recommended for subacute or chronic low back pain, both with high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Most RCTs failed to find beneficial effects of infliximab for lumbar radicular pain syndromes in contrast with results from non-RCTs, and thus, tumour necrosis factor- α are moderately not recommended, moderate confidence. Tumour necrosis factor- α are also not recommended, moderate confidence, for other spine conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is one moderate quality trial comparing theraamine with low dose naproxen. This may have biases similar to a non-treatment or wait listed control group. Thus, in the absence of quality trials, there is no recommendation, low confidence, for treatment of spine disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation for herbs for the treatment of low back pain with the exception that willow bark (salix) is not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Capsaicin may be a useful adjunct and is moderately recommended, moderate confidence, for short-term but not long-term treatment of acute or subacute low back pain or temporary flare-ups of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Spiroflor is not recommended, low confidence, for treatment of acute, subacute or chronic low back pain as it appears less efficacious than capsaicin and there are other treatments that are efficacious.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The use of topical NSAIDs or other creams and ointments for treatment of acute, subacute or chronic low back pain have no recommendation, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

For treatment of chronic low back pain, dimethyl sulfoxide, N-acetylcysteine, eutectic mixture of local anaesthetics and wheatgrass cream are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

As there is an absence of quality evidence of efficacy of vitamins for treatment of spine disorders in the absence of documented deficiencies, vitamin supplementation is not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

While one moderate-quality study suggested it may be effective, three others found it ineffective, and thus, kinesiotaping is not recommended, moderate confidence, for treatment of spine conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Shoe lifts are recommended, low confidence, for treatment of chronic or recurrent low back pain among individuals with significant leg length discrepancy of more than 2 cm, otherwise they are not recommended, moderate confidence, for treatment of other spine disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Shoe insoles or lifts are not recommended, moderate confidence, for prevention of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation, low confidence, for shoe insoles for those with prolonged walking requirements.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Lumbar supports have been used particularly in postoperative lumbar fusion with a goal to facilitate bony union, and while there are no quality studies for that purpose, they are recommended, high confidence, for that discrete indication.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Outdated, risk-benefit

Most of the highest quality studies suggest lack of efficacy of lumbar supports for either the prevention or treatment of low back pain, and thus they are not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Magnets are moderately not recommended, high confidence, for treatment of any low back pain disorder.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

As there are no quality studies showing iontophoresis is effective for any of the low back pain disorders, there is no recommendation, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	88%
Use in the appropriate context:	Yes
Comments:	None

Massage is recommended, low confidence, for select use in subacute or chronic low back pain as an adjunct to more efficacious treatments consisting primarily of a graded aerobic and strengthening exercise program.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Massage is recommended, low confidence, for select use in acute low back pain or chronic radicular pain syndromes in which low back pain is a substantial symptom component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Mechanical devices for administering massage are not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Reflexology has not been shown to be clearly efficacious for the treatment of chronic low back pain in either of two moderate-quality studies and is thus not recommended for chronic low back pain and not recommended for other low back pain disorders, both with moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation, low confidence, for treatment of any of the low back pain disorders with myofascial release.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Traction is strongly not recommended for treatment of subacute or chronic low back pain, moderately not recommended for radicular pain, and not recommended for acute or postoperative low back pain, all moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Decompression through traction and spinal decompressive devices is not recommended, moderate confidence, for treatment of acute, subacute, chronic, postoperative low back pain or radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

Inversion therapy has been used for treatment of patients with herniated discs and low back pain, but as there is no quality evidence of efficacy, there is no recommendation, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Manipulation or mobilisation of the lumbar spine is recommended, low confidence, for select treatment of acute or subacute low back pain or radicular pain syndromes without neurological deficit, generally if needed after treatment with NSAIDs, directional and aerobic exercise.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Manipulation or mobilisation for short-term relief of chronic pain while used as a component of an active exercise program is also recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Manipulation is not recommended, low confidence, for treatment of radicular pain syndromes with progressive motor loss.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Manipulation or mobilisation of regions outside of/not adjacent to the lumbopelvic area (e.g. cervical spine, lower extremity) when treating low back pain is not recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Manipulation under anaesthesia and medication assisted spinal manipulation are not recommended, moderate confidence for treatment of acute, subacute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Self-applications of low tech heat therapies are recommended and cryotherapies are recommended, both with low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

High-tech devices or provider-based applications of heat and/or cryotherapy are costly, have no quality evidence of efficacy for treatment of low back pain and thus are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The highest quality trials of diathermy suggest a lack of efficacy, and thus, diathermy is not recommended, moderate confidence, for treatment of any type of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

As available evidence conflicts, there is no recommendation, low confidence, for or against the use of infrared therapy for treatment of acute, subacute, chronic, radicular or postoperative low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Conflicting evidence

There is only one small study, no sizable quality studies of ultrasound for the treatment of low back pain, and thus, there is no recommendation, low confidence, for or against the use of ultra sound for treatment of acute, subacute, chronic, radicular or postoperative low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Low-level laser therapy is not recommended, moderate confidence, for treatment of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Acupuncture is recommended, low confidence, for selective use to treat chronic moderate to severe low back pain as an adjunct to more efficacious treatments as there is no quality evidence of lasting effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For treatment of acute, subacute, radicular or postoperative low back pain, there are no quality studies, there are other effective treatments for those patients, and thus, acupuncture is not recommended, moderate confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

TENS is not recommended, moderate confidence, for treatment of acute or subacute low back pain or acute radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

TENS is recommended, low confidence, for select use in treatment of chronic low back pain or chronic radicular pain syndrome as an adjunct to more efficacious treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

All of the following are not recommended, low confidence: microcurrent electrical stimulation, neuromuscular electrical stimulation (non-chronic pain) and percutaneous electrical nerve stimulation (PENS).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, imprecise

There is no recommendation, low confidence, for or against all of: H-wave device stimulation therapy, high-voltage galvanic therapy, interferential therapy and neuromuscular electrical stimulation (chronic low back pain, chronic radicular pain).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Comprehensive evidence-based guidelines for facet joint interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians Guidelines (American Society of Interventional Pain Physicians, 2020)

AGREE GRS: 6/5/5

The level of evidence is II in selecting patients for facet joint nerve blocks at least 3 months after onset and failure of conservative management, with strong strength of recommendation for physical examination and clinical assessment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality evidence

The level of evidence is IV for accurate diagnosis of facet joint pain with physical examination based on symptoms and signs, with weak strength of recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Weak evidence; Not alone

The level of evidence is I with strong strength of recommendation, for mandatory fluoroscopic or CT guidance for all facet joint interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is III with weak strength of recommendation for SPECT.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Poor specificity, imprecise

The level of evidence is V with weak strength of recommendation for scintigraphy, MRI and CT.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Can rule out other causes

The level of evidence is I to II with moderate to strong strength of recommendation for lumbar diagnostic facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is II with moderate strength of recommendation for cervical diagnostic facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is II with moderate strength of recommendation for thoracic diagnostic facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is II with moderate strength of recommendation for lumbar radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is II with moderate strength of recommendation for therapeutic lumbar facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	66%
Use in the appropriate context:	Yes, modifications
Comments:	When RFA not an option

The level of evidence is IV with weak strength of recommendation for lumbar facet joint intra-articular injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Weak evidence, short term

The level of evidence is II with moderate strength of recommendation for cervical radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is II with moderate strength of recommendation for therapeutic cervical facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	66%
Use in the appropriate context:	Yes, modifications
Comments:	When RFA not an option

The level of evidence is V with weak strength of recommendation for cervical intra-articular facet joint injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Weak evidence, short term

The level of evidence is III with weak to moderate strength of recommendation with emerging evidence for thoracic radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Weak evidence, individual

The level of evidence is II with moderate strength of recommendation for thoracic therapeutic facet joint nerve blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

The level of evidence is III with weak to moderate strength of recommendation for thoracic intra-articular facet joint injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Weak evidence, short term

The level of evidence is II with moderate strength of recommendation to avoid opioid analgesics during the diagnosis with interventional techniques.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Good practice, individual

The level of evidence is II with moderate strength of recommendation that moderate sedation may be utilized for patient comfort and to control anxiety for therapeutic facet joint interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Risks diagnostic validity

Facet joint interventions are considered moderate to low risk procedures; consequently, antithrombotic therapy may be continued based on overall general status.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	Safe with careful technique

ACOEM guidelines: Invasive treatments for low back disorders (American College of Occupational and Environmental Medicine, 2021)

AGREE GRS: 6/5/6

An epidural corticosteroid injection is recommended, moderate confidence, for select circumstances as an option for treatment of acute or subacute radicular pain syndromes, typically after treatment with NSAIDs and waiting at least 3 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Epidural corticosteroid injections are moderately not recommended, moderate confidence, for treatment of spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Epidural corticosteroid injections are not recommended, high confidence, for treatment of acute, subacute or chronic low back pain in the absence of significant radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Intradiscal steroid injections are not recommended, moderate confidence, for treatment of acute low back pain and are not recommended, moderate confidence, for treatment of subacute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Ketamine infusions do not have quality evidence of efficacy and are not recommended, high confidence, for treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Epidural clonidine is not recommended, moderate confidence, for treatment of radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation, low confidence, for or against the use of epidural clonidine for treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Limited evidence

There is no recommendation, low confidence, for or against the use of intramuscular clonidine for treatment of piriformis syndrome or other low back conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Limited evidence

Trigger and/or tender point injections are not recommended, moderate confidence, for treatment of acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Trigger and/or tender point injections may be recommended, low confidence, as a reasonable second or tertiary option for treatment of subacute or chronic low back pain that is not resolving with progressive aerobic exercise, and other exercises and NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Corticosteroids are not recommended, moderate confidence, for use in trigger point injections

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Diagnostic facet joint injections are not recommended, low confidence, for evaluation of patients with chronic low back pain including that which is significantly exacerbated by extension and rotation or associated with lumbar rigidity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Diagnostic facet joint injections are not recommended, low confidence, for acute or subacute low back pain or radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Diagnostic medial branch blocks are not recommended, low confidence, for acute or subacute low back pain or radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Therapeutic facet joint injections are not recommended, low confidence, for treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Therapeutic facet joint injections are not recommended, moderate confidence, for treatment of acute, subacute low back pain or for any radicular pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Therapeutic facet joint injections are moderately not recommended, moderate confidence, for routine treatment of chronic non-specific axial pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Repeat use of intra-articular therapeutic facet joint injections are moderately not recommended, moderate confidence, for patients who have failed to achieve lasting functional improvements with a prior injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Facet joint injections with hyaluronic acid are not recommended, low confidence, for treatment of facet degenerative joint disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Sacroiliac joint corticosteroid injections are recommended, low confidence, as a treatment option for patients with a specific known cause of sacroiliitis, that is, proven rheumatologic inflammatory arthritis (e.g. rheumatoid arthritis, ankylosing spondylitis) involving the sacroiliac joints with symptoms of at least 1 to 2 months and prior treatment that has included NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There are no quality studies showing a long-term improvement in pain or function in those receiving sacroiliac injections for chronic non-specific low back pain. Sacroiliac joint injections are not recommended, low confidence, for treatment of acute low back pain including low back pain thought to be sacroiliac joint related; subacute or chronic non-specific low back pain, including pain attributed to the sacroiliac joints, but without evidence of inflammatory sacroiliitis (rheumatologic disease); or any radicular pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Prolotherapy injections are strongly not recommended, high confidence, for treatment of acute, subacute or chronic low back pain or radicular pain syndromes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

Botulinum injections are invasive, have adverse effects that include fatalities and are costly and with conflicting data. There is thus no recommendation, low confidence, for or against the use of botulinum injections for treatment of acute, subacute or chronic low back pain or radicular pain syndromes or other low back-related problems.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Conflicting evidence

Radiofrequency neurotomy, neurotomy or facet rhizotomy are not recommended, low confidence, for treatment of patients with chronic low back pain including that confirmed with diagnostic blocks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Radiofrequency neurotomy, neurotomy or facet rhizotomy are not recommended, low confidence, for treatment of all other lumbar spinal conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Radiofrequency lesioning of the dorsal root ganglia is moderately not recommended, moderate confidence, for treatment of chronic sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

As intradiscal electrothermic therapy has not been clearly shown to be beneficial, there is no adequate evidence to recommend this and it is not recommended, low confidence, for treatment of acute, subacute or chronic low back pain or any other back-related disorder.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Percutaneous intradiscal radiofrequency thermocoagulation is moderately not recommended, moderate confidence, for treatment of acute, subacute or chronic low back pain, particularly including discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Lumbar discectomy is an effective operation to speed recovery in patients with radiculopathy due to ongoing nerve root compression who have not improved significantly after 4 to 6 weeks of time and appropriate conservative therapy, it is thus moderately recommended, high confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Discectomy is not recommended, high confidence, for treatment of acute, subacute or chronic low back pain without radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

There is no quality evidence that automated percutaneous discectomy, laser discectomy or coblation therapy are effective treatments for any back or radicular pain problem, and thus they are not recommended, low confidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Adhesiolysis is not recommended, low confidence, for treatment of acute, subacute or chronic low back pain, or spinal stenosis or radicular pain syndromes

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Decompression surgery is moderately recommended, moderate confidence, for treatment of patients with symptomatic spinal stenosis (neurogenic claudication) that is intractable to nonoperative management. Caution is warranted among elderly with multiple comorbidities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Regarding isthmic spondylolisthesis, lumbar fusion is recommended, moderate confidence. Indications are: LBP with documented instability, with either: (1) more than or equal to 5mm of translation of the superior vertebral body on the inferior body from the full extension film to the full flexion films; and/or (2) a total angular movement during flexion and extension at the unstable level that is at least 20° greater than the motion present at an adjacent disc. Lumbar fusion is also indicated for grades 3, 4, and 5 spondylolisthesis; (2) a decompressive laminectomy at an area of degenerative instability as in the case of a coexisting spondylolisthesis or scoliosis when a discectomy is performed at the same level; (3) a decompressive laminectomy performed at an area of degenerative instability, as in the case of a coexisting spondylolisthesis or scoliosis where there is gross movement on flexion extension radiographs; and (4) a decompressive laminectomy at an area of degenerative instability as in the case of a coexisting spondylolisthesis or scoliosis where an adequate decompression requires the removal of greater than 50% of both facets or the complete removal of a unilateral facet complex.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Lumbar fusion is moderately not recommended, moderate confidence, as a treatment for chronic non-specific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

Lumbar fusion is not recommended, moderate confidence, to treat radiculopathy from disc herniation or for most patients with chronic low back pain after lumbar discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Among those having undergone two prior discectomies, it is believed to be a reasonable option to attempt fusion to avoid the theoretical need for a fourth discectomy and thus, spinal fusion is recommended, low confidence, as an option at the time of discectomy if a patient is having the third lumbar discectomy on the same disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

In the absence of proven instability or deformity, lumbar fusion is not recommended, moderate confidence, for treatment of spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

Artificial disc replacement is not recommended, insufficient evidence, for treatment of chronic nonspecific low back pain and any other spinal pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

There is no recommendation, low confidence, regarding artificial disc replacement as a treatment for subacute or chronic radiculopathy or myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Vertebroplasty is strongly not recommended (subacute, chronic), high confidence; not recommended (acute), moderate confidence, as a routine treatment for patients with low back or thoracic pain due to vertebral compression fractures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is no recommendation, low confidence, for or against the use of vertebroplasty for treatment of highly select patients with low back or thoracic pain due to unusual vertebral compression fractures, that is, for highly select patients with severe pain lasting over 2 months who have failed other interventions (including quality medical management) and for whom there are no other options available, whose significant pain is not resolving, pathological fractures due to neoplasia's, multiple simultaneous compression fractures (three or more) and especially for those having failed bisphosphonate therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is no recommendation, low confidence, for or against the use of kyphoplasty for the treatment of low back or thoracic pain due to vertebral compression fractures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

As there are no quality trials comparing sacroiliac joint fusion with a quality rehabilitative program, sacroiliac joint fusion surgery and other sacroiliac joint surgical procedures are not recommended, low confidence, for treatment of any low back pain disorder.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Without quality evidence of enduring efficacy compared with either sham-control or a quality functional restoration program, implantable spinal cord stimulators are not recommended, low confidence, for treatment of acute, subacute, chronic low back pain, radicular pain syndromes or failed back surgery syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated

MRI spine area of interest without and with intravenous contrast or MRI spine area of interest without intravenous contrast is usually appropriate for the initial imaging of patients with acute onset myelopathy. These procedures are equivalent alternatives (i.e. only one procedure will be ordered to provide the clinical information to effectively manage the patient's care).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

MRI spine area of interest without and with intravenous contrast or MRI spine area of interest without intravenous contrast is usually appropriate for the initial imaging of patients with chronic or progressive myelopathy. These procedures are equivalent alternatives (i.e. only one procedure will be ordered to provide the clinical information to effectively manage the patient's care).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

CT spine area of interest without and with intravenous contrast or CT spine area of interest without intravenous contrast may be appropriate for the initial imaging of patients with acute onset myelopathy. These procedures are equivalent alternatives (i.e. only one procedure will be ordered to provide the clinical information to effectively manage the patient's care).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

CT spine area of interest without and with intravenous contrast or CT spine area of interest without intravenous contrast may be appropriate for the initial imaging of patients with chronic or progressive myelopathy. These procedures are equivalent alternatives (i.e. only one procedure will be ordered to provide the clinical information to effectively manage the patient's care).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

CT myelography are of interest may be appropriate for the initial imaging of patients with acute onset myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

CT myelography are of interest may be appropriate for the initial imaging of patients with chronic or progressive myelopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Epidural interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians comprehensive evidence-based guidelines (American Society of Interventional Pain Physicians, 2021)

AGREE GRS: 6/5/5

Based on relevant evidence and results of previous systematic reviews, high-quality fluoroscopically guided epidural injections, with or without steroids, the evidence is Level I with strong recommendation for long-term effectiveness.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Percutaneous adhesiolysis for disc herniation (post-conservative failure): The evidence is Level II with moderate to strong recommendation for long-term improvement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Based on one relevant, high-quality RCT of thoracic epidural with fluoroscopic guidance for thoracic disc herniations, the evidence is Level II with moderate to strong recommendation for long-term effectiveness.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low to moderate quality

For spinal stenosis, evidence is Level III to II for caudal epidural injections with moderate to strong recommendation for long-term improvement. Evidence is Level II for lumbar and cervical interlaminar epidural injections with moderate to strong recommendation for long-term improvement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

The evidence is Level IV to III with moderate recommendation for long-term improvement for lumbar transforaminal epidural injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Limited evidence, short-term

Evidence is Level II with moderate to strong recommendation for long-term improvement after failure of conservative management and fluoroscopically directed epidural injections for percutaneous adhesiolysis in lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Evidence is Level II with moderate to strong recommendation for long-term improvement, with or without steroids for axial discogenic pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	Yes, modifications
Comments:	Small benefit, risk

For post-surgery syndrome, evidence is Level II with moderate to strong recommendation for long-term improvement with caudal epidural injections and cervical interlaminar epidural injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative opioid evaluation (Congress of Neurological Surgeons, 2021)

AGREE GRS: 6/5/4

Longer duration of opioid use before spine surgery is associated with worse outcomes (chronic postoperative opioid use, higher complications, increased length of stay and higher costs and utilization of resources).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Preoperative opioid use of any dose (yes/no) is associated with risk of longer duration of postoperative opioid use and worse clinical and patient-reported outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to support the efficacy of opioid weaning on postoperative opioid use, improving outcomes, or reducing adverse events after spine surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient, individual

Congress of Neurological Surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative osteoporosis assessment (Congress of Neurological Surgeons, 2021)

AGREE GRS: 6/5/5

Preoperative testing with a dual-energy X-ray absorptiometry scan (DEXA) T-score < -2.5, a CT scan (Hounsfield units < 97.9), or serum vitamin D3 level <20 ng/mL is associated with poor bone mineral density and predicts an increased risk of a postoperative adverse event in individuals undergoing spinal instrumentation. Preoperative assessment with one of these tests (DEXA scan, CT, or serum vitamin D3 level) should be performed in patients with suspected osteoporosis. Patients with confirmed osteoporosis should be counselled regarding the potential increased risk of postoperative adverse events.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Clinicians should consider preoperative teriparatide in patients with osteoporosis undergoing spinal instrumentation to decrease the risk of postoperative adverse events, including screw loosening and a delayed or lower rate of fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

There is insufficient evidence to support the use of bisphosphonates alone in patients with osteoporosis undergoing spinal instrumentation to decrease postoperative adverse events after spinal instrumentation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Non-surgical interventions for lumbar spinal stenosis leading to neurogenic claudication: a clinical practice guideline (Canadian Chiropractic Research Foundation, 2021)

AGREE GRS: 5/4/4

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we suggest offering a combination of education and advice, manual therapy and home-based exercise for improvement in walking capacity and symptoms/physical function in the short and long term.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we suggest considering traditional acupuncture on a trial basis to improve pain and physical function in the short-term.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

For patients with lumbar spinal stenosis and neurogenic claudication, we suggest offering post-operative rehabilitation with cognitive behavioural therapy to reduce pain and improve function at 1 month and 12 months post-surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Limited evidence, individual

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of NSAIDs for any duration.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of methylcobalamin or paracetamol (acetaminophen).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of calcitonin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we suggest to consider a trial of serotonin–norepinephrine reuptake inhibitors or tricyclic antidepressants.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Very low evidence

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of opioids as first line treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of muscle relaxants.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of pregabalin for short-term reduction in pain and improved function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of gabapentin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For patients with lumbar spinal stenosis and neurogenic claudication with or without low back pain, we do not suggest the use of epidural steroidal injections for short term reduction in pain and improved function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The American Society of Pain and Neuroscience evidence-based clinical guideline of interventional treatments for low back pain (American Society of Pain and Neuroscience, 2022)

AGREE GRS: 5/5/5

Interlaminar epidural injections for treatment of low back and radicular pain originating from disc disease, spinal stenosis and for chronic back/leg pain after surgical intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Transforaminal epidural injections for treatment of low back and radicular pain originating from disc disease, spinal stenosis and for chronic back/leg pain after surgical intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Strongest for radicular

Caudal epidural injections for treatment of low back and radicular pain originating from disc disease, spinal stenosis and for chronic back/leg pain after surgical intervention when interlaminar or transforaminal approaches are not feasible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Use of either steroid or local anaesthetic or the two classes of medication in combination for use in epidural injections for treatment of low back and radicular pain originating from disc disease, spinal stenosis and for chronic back/leg pain after surgical intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The type of medication for trigger point injections does not make a significant difference in pain outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Eliciting a localized twitch response for needle placement predicts best outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

In medically refractory cases, trigger point injections with botulinum toxin a may be of benefit.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Dilute local anaesthetic concentrations may result in less injection pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Novel injectables may be of benefit for myofascial pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Adjunct therapies may be of use to prolong the relief of trigger point injections for myofascial pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	58%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Intra-articular facet steroid injections do not replace or delay the need for radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Intra-articular facet steroid injections can be prognostic for radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In acute cases of facet mediate pain, facet steroid injections may help due to possible inflammatory component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Combining facet steroid injections with oral NSAIDs can be more effective than injection therapy alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Small effect, individual

Image guided facet steroid injections are more effective than blind injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Do not use intra-articular facet joint steroid injections as sole therapy for facet-mediated pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Whitacre needles can reduce the risk of intravenous injection during medial branch block.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	Good practice

Lumbar medial branch blocks can be prognostic for radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence regarding intradiscal platelet rich plasma in the treatment of discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence regarding intradiscal allogeneic mesenchymal stem cells in the treatment of discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence regarding intradiscal bone marrow derived mesenchymal stem cells in the treatment of discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence regarding intradiscal adipose tissue derived mesenchymal stem cells in the treatment of discogenic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Sacroiliac joint injections have been associated with positive predictive value in diagnosis of sacroiliac joint dysfunction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Sacroiliac joint injections demonstrate short term relief of sacroiliac joint dysfunction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Percutaneous lumbar decompression for ligamentum flavum hypertrophy with the diagnosis of lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Mixed evidence, individual

Stand-alone interspinous spacers for indirect decompression are safe and effective for the treatment of mild to moderate lumbar spinal stenosis if no contraindications exist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Conflicting evidence

Micro-endoscopic discectomy for the treatment of lumbar disc herniations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Percutaneous endoscopic discectomy for the treatment of lumbar disc herniations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Tubular discectomy for the treatment of lumbar disc herniations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Interspinous fusion devices can be used as a stand-alone device for decompression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Conflicting evidence

Interspinous fusion devices can be used as a stand-alone device for spinal fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Insufficient durable data

Interspinous fusion devices are a suitable option to those patients not suited for pedicle screw fixation, non-surgical candidates, and those early in the treatment paradigm.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Insufficient durable data

Minimally invasive sacroiliac fusion for sacroiliac joint pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Spinal cord stimulation following lumbar spinal surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Spinal cord stimulation in the treatment of non-surgical low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Emerging data, individual

Spinal cord stimulation in the treatment of patients with predominate lumbar spinal stenosis

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Intrathecal drug delivery is safe and effective in chronic refractory pain of spinal origin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Tight governance

Intrathecal drug delivery is safe and effective in refractory failed back surgery syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Tight governance

Intrathecal ziconotide is safe and effective for chronic non-cancer pain management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Consider risks

Intrathecal opioids are safe and effective in chronic non-cancer pain management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consider risks

Intrathecal bupivacaine is safe and effective for chronic non-cancer pain management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Consider risks

Intrathecal drug delivery can help minimize medication utilization through oral route.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Intrathecal combination drug therapy is effective in chronic refractory pain of spinal origin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Consider risks

Intrathecal drug therapy can help improve function and quality of life in chronic refractory pain of spinal origin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Consider risks

Intrathecal ziconotide can augment opioid analgesic effect.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Intrathecal combination (opioids + local anaesthetic ± ziconotide) therapy can prolong the development of intrathecal opioid tolerance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Shared decision making should be utilized if contemplating intrathecal drug therapy in patients with multiple co-morbidities affecting cardiopulmonary function, hematopoietic function, or central nervous function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The incidence of serious procedure or device related complications is favourable for multifidus activation via medial branch nerve stimulation to other neuromodulation techniques.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Device-specific data

Improvements in baseline are clinically significant at both 1 and 2 years after implant for multifidus activation via medial branch nerve stimulation in a cohort of patients with severe, disabling chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Improvements in pain and disability increase the longer duration of treatment for multifidus activation via medial branch nerve stimulation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient long-term data

The infection rate of non-coiled leads is 25 times higher than rate for coiled leads for multifidus activation via medial branch nerve stimulation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Percutaneous 60 day peripheral nerve stimulation may provide sustained improvements in pain and function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient long-term data

Percutaneous peripheral nerve stimulation may reduce or eliminate need for analgesics in individuals with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Peripheral nerve field stimulation can be considered in patients with chronic axial low back, with and without radicular symptoms in their lower extremities, who have failed other treatment modalities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Heterogeneous evidence

Conventional radiofrequency ablation is effective for low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Conventional radiofrequency ablation is superior to pulsed radiofrequency ablation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Pulsed radiofrequency ablation is not efficacious.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Conventional radiofrequency ablation and cooled radiofrequency ablation are equally efficacious.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Sacroiliac joint denervation/ablation is effective in treatment of sacroiliac joint dysfunction pain and is superior to sham in RCT.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Basivertebral nerve ablation for low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Informed consent for spine procedures: best practice guideline from the American Society of Pain and Neuroscience (American Society of Pain and Neuroscience, 2023)

AGREE GRS: 5/7/6

It is strongly recommended to discuss the determined or potential pathology that may be contributing to the patient's symptoms. Patients should be informed that the natural progression of their disease may evolve and require further evaluation and procedures. The discussion should be tailored to meet the patient's individual needs in order to effectively convey the information.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended that the risks and benefits of the proposed treatment against natural history are discussed. Risks that would affect the decision-making of a rational patient should be elaborated, as well as anything that poses potentially grave adverse consequences. If objective data are available regarding the associated risks, it is recommended to present them in the form of proportions rather than percentages.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	88%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to discuss the alternatives, including no intervention, for the established diagnosis. Alternatives should be presented on a spectrum from least-invasive to most invasive options. Referral to appropriate providers is encouraged to further discuss available alternative treatment options.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	86%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to disclose the involvement of trainees prior to the procedure. Providers should emphasize the credentials, level of training, and involvement of the trainees who will participate in the procedure. Reassurance should be provided regarding the level of supervision during the procedure.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended that informed consent is obtained by the provider who will be performing the procedure.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to obtain written consent prior to the use of any portion of the patient's medical course, including photography and videography.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Although there is no established optimal time for obtaining consent, the authors strongly recommend initiating the informed consent discussion at the pre-operative encounter. This allows adequate time for the patient to process the information and the opportunity to formulate and ask questions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to document the content of informed consent discussion in the patient's medical records, including questions the patient asked and the patient's understanding of the procedure risks, benefits, and alternatives.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	88%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended that informed consent documents be written at a sixth-grade reading level.

AIRE score:	NA
Donabedian:	Structure
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

As the informed consent process continues to evolve, it is strongly recommended to incorporate multimedia to increase patients' understanding of the discussion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Good practice

South America Chronic nonspecific low back pain: Rehabilitation (Brazilian Association of Physical Medicine and Rehabilitation, 2013)

AGREE GRS: 4/4/4

Acetaminophen (paracetamol) at a dose of 500 mg, 4-6x/day, PO, for four weeks is recommended in patients with chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Nonselective COX inhibitor NSAIDs are effective in managing pain in patients with chronic low back pain. Indomethacin, 25 mg, 3x/day, for six weeks is recommended; piroxicam at a daily dose of 20 mg; diclofenac at a daily dose of 150 mg for four weeks or naproxen 550 mg, 2x/day, for 14 days. Although non-selective NSAIDs are well tolerated, these drugs are associated with mild to severe gastrointestinal complications, usually after a long period of use.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Selective COX-2 inhibitor NSAIDs, such as nimesulide at a dose of 100 mg, 2x/day, and meloxicam 7.5 mg, 1x/day in association with a steroid (betamethasone) and a muscle relaxant (tetrazepam) have been shown to be effective in donor reduction in patients with low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Clinical judgment
Comments:	Individual, risk-benefit

Highly selective COX-2 inhibitor NSAIDs such as celecoxib at a dose of 200 mg, 2x/day, for six weeks and etoricoxib 60 mg/day are effective in managing pain in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The patients with chronic nonspecific low back pain, analysed in the randomized controlled studies, and who benefited from the use of opioids were those who maintained moderate to severe low back pain, referred to as VAS > 40 mm, despite the use of analgesics, anti-inflammatories, and even opioids.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of tramadol in association with paracetamol (37.5/325 mg) between four and eight doses for a maximum period of 24 hours has a significant impact on the improvement of pain, dysfunction and quality of life resulting from chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of tramadol in combination with paracetamol (37.5/325 mg) between four and eight doses for a maximum period of 24 hours for 90 days had the same outcome as tramadol alone (50 mg) with fewer side effects in a 10-day treatment cycle of subacute low back pain (10-42 days) of nonspecific origin.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

In patients with chronic low back pain without distinction of aetiology (nociceptive or neuropathic), the use of buprenorphine transdermal patch was effective in pain control over four weeks, with a good safety profile.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

Individuals who used opiates for moderate-to-severe non-specific chronic low-back pain for less than six months achieved satisfactory pain control over a 12-week period with hydromorphone extended-release compared to a placebo

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

The use of oxymorphone extended-release for 4 weeks was efficacious and safe for the treatment of low-back pain compared to a placebo in usual opiate users.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

The use of oxymorphone or oxycodone at equivalent doses for 18 days more effectively controlled of non-specific chronic low-back pain compared to a placebo, and exhibited the same safety profile.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

Celecoxib use (200 mg, twice per day) for 6 weeks was superior to tramadol (50 mg, 4 times per day) for the treatment of moderate-to-severe non-specific chronic low-back pain and induced fewer side effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The combined use of long-release and short-acting opiates was more beneficial for the treatment of non-specific mechanical low-back pain compared to controlled-release opiate and naproxen during a 16-week treatment period.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

Antidepressants play a relevant role in the management of non-specific low-back pain, albeit with variable efficacy. Agents with associated adrenergic effects, such as tricyclic and dual antidepressants, exhibited better results when compared to selective serotonin reuptake inhibitors, most of which exhibited insufficient and doubtful results.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Duloxetine at doses of 20 or 60 mg/day over a 12-week period is recommended as a first-choice therapy

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Escitalopram at a dose of 20 mg/day for up to 12 weeks is a possible alternative because it induced results similar to those observed with duloxetine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

The use of these agents for > 3 months is not recommended, as the occurrence of side effects was observed after that period in all studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Benefit not immediately

Muscle relaxants are not recommended as first-choice agents for the treatment of non-specific chronic low-back pain due to the lack of sound data in the medical literature regarding their beneficial effects on pain compared to their side effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The use of continuous ultrasound is recommended at a 1-MHz frequency, 1-W/cm² potency, and 5-cm² transducer area, administered by performing slow circular motions on the lumbar paravertebral region for 10 minutes, together with a supervised exercise programme that focuses on the abdominal and lumbar muscles, is preceded by a 5-minute warm-up, and is followed by 5 minutes of stretching, thrice weekly for 6 weeks as a treatment for non-specific chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Ultrasound is contraindicated in cases with the risk of gaseous fluid cavitation, such as in the eyeball and pregnant uterus, as well as on plastic endoprosthesis components, methacrylate, and the heart, in which it might cause turbulence in addition to cavitation. Ultrasound is further contraindicated on epiphyseal plates, areas with damaged skin, patients with cognitive and intellectual deficit, as well as on tumours due to the risk of proliferation. Ultrasound should be avoided on anaesthetic areas and joint facets close to regions where the spinal cord is exposed, as in laminectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Immersion in medicinal or tap water at a temperature of 34 °C for 20 minutes/day over a 3-week period is recommended for the treatment of non-specific chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Shortwave diathermy is recommended on the lumbar region thrice-weekly for 15 minutes per session over a 6-week period for the treatment of non-specific chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Electrical stimulation and the other physical means are thought to facilitate analgesia in the affected individuals in order to achieve physical rehabilitation through exercise programmes designed for non-specific chronic low-back pain; these programmes not only induce gains in but also maintain the range of motion by stimulating flexibility and strengthening the muscles that stabilise the trunk and the abdomen, in addition to the gluteal muscles.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Both TENS and PENS are recommended, albeit with some restrictions derived from their contraindications and side effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Insufficient, imprecise

TENS involves the application of a biphasic symmetrical wave at a 50-Hz frequency and a 50-ms phase. The current intensity must be established on an individual basis until apparent muscle contraction is achieved (60-130 mA). Stimulation must be applied to induce contraction for 10 seconds and relaxation for 10 seconds. Bilateral placement of the electrodes at the level of L2 to L4 on the spinal erectors motor points is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The advantages of TENS include the possibility of home application without the need of a trained professional to place the electrodes, as the patient can be sufficiently trained and can understand the instructions given to ensure appropriate use, provided contraindications do not apply.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

For PENS, it is recommended to bilaterally place the needles at the levels corresponding to T12, L3, L5, S2, and at the piriformis muscle motor point; stimulation must be applied for 30 minutes at T12 and for 15 minutes at the other sites twice weekly for eight weeks. Additionally, a 60-minute exercise programme should be indicated with the intent to promote strength and flexibility, along with an aerobic component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Exercise is indicated for the treatment of non-specific chronic low-back pain. However, several types of exercise have been reported in the literature, while most studies in fact applied combinations of several types to a single intervention group. As a result, there is no sound evidence to indicate the superiority of any one type of specific exercise over any other for the treatment of non-specific chronic low-back pain. That fact notwithstanding, all studies found improvements in pain, independent of the exercise type and frequency.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Not enough studies of satisfactory quality have been found to enable a sound evidence-based recommendation regarding the use of acupuncture for the treatment of non-specific chronic mechanical low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

The combined use of acupuncture and conservative treatment modalities such as physical therapy, NSAIDs, analgesia, heat, self-care, and postural education was more beneficial than those same therapies alone for the treatment of non-specific chronic mechanical low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

There is a continued controversy regarding the efficacy of true acupuncture (deep needle insertion in the acupoints) versus that of sham acupuncture (superficial needle insertion in sites distant from acupoints) for the treatment of non-specific low-back pain. While some studies reported benefits with true acupuncture, others found both techniques to be equivalent. That controversy notwithstanding, sham acupuncture (superficial needle insertion) has been shown not to be an inert procedure. Additionally, one study found no benefit with the use of true acupuncture in individuals with chronic low-back pain compared to the use of simulated acupuncture (no actual needle insertion, but mere skin stimulation).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	Conflicting evidence

Acupuncture proved more efficacious than a placebo (TENS) in one high-quality study, although this finding was not confirmed by another study; this discrepancy might be due to the differences in quality between the studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Acupuncture was found inferior to massage with respect to pain and disability after 10 weekly sessions for the treatment of non-specific chronic low-back pain. That difference was maintained at a 1-year follow-up.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Acupuncture proved to be more beneficial than local anaesthetic injection when both applied at the most painful palpation points for the treatment of chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

No currently available evidence allows the characterisation of ergonomic interventions as beneficial for the reduction and prevention of non-specific chronic low-back pain relapses.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No currently available evidence allows the characterisation of exercise as a means for preventing pain relapse. The available studies show that independently of the type, time, duration, and intensity of exercise, its benefit for the prevention of future episodes of pain cannot be asserted.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Although acupuncture for the treatment of non-specific low-back pain is associated with a cost increase, 10 sessions at a twice-weekly frequency are recommended, as these improve the patients' quality of life and reduce work absenteeism and thus reduce the individuals' social costs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Acupuncture in addition to routine care induced relevant clinical benefits and was found to be cost-effective in patients with chronic low-back pain who were assisted at German primary care centres. Therefore, acupuncture should be considered as a feasible option for the management of patients with chronic low-back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Low back pain – Clinical practice guideline (Ecuadorian Ministry of Public Health, 2016)

AGREE GRS: 5/5/5

It is recommended to avoid overweight and obesity through a balanced diet and physical activity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is necessary to educate the population about postures that prevent low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Imprecise

It is recommended to educate patients with low back pain by providing information, since this results in earlier recovery, reduces the number of medical visits, and improves functional status.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Providing education about aggravating factors, the natural course, and the expected duration helps accelerate improvement in patients with acute low back pain and prevents the development of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Imprecise

Patients with acute low back pain should be clearly informed about the good prognosis of the condition in most cases.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to provide information about the favourable prognosis of acute low back pain, with or without sciatica, including the possibility of substantial improvement within the first month, as well as the need to remain active and maintain good postural habits as self-care strategies for early return to work.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In the management of a patient with low back pain, a multidisciplinary treatment approach is recommended, including exercises, workplace visits, ergonomic counselling and behavioural treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended that the physician provide the patient with evidence-based information about the expected course of low back pain, encourage maintenance of activity and give effective information on self-care.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

An increase in body mass index represents a risk factor for low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

In patients with chronic low back pain who are overweight or obese, weight reduction supported by the intervention of a multidisciplinary team is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is a relationship between poor eating habits, alcoholism and low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Tobacco use is a weak risk factor for the development of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

A sedentary lifestyle associated with poor postural habits favours the development of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Psychosocial alterations such as depression, insomnia, increased aggressiveness, violence, fatigue, workplace harassment and hyperactivity are associated with an increased occurrence of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to investigate psychosocial aspects as risk factors for low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Psychosocial factors play an important role in chronic low back pain and disability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

From the first clinical evaluation, it is recommended to investigate and identify psychosocial factors associated with the risk of developing chronic disability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to investigate the type of work activity performed, postures, tools used, efforts required, and their frequency, in order to identify potentially harmful situations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Prolonged rest or inactivity perpetuates low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Within the first six weeks, 90% of acute low back pain episodes resolve satisfactorily with treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

In patients with progressive recovery and minimal use of medications, it is recommended to encourage timely return to usual and work activities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Cognitive behavioural therapy is not recommended for the treatment of acute low back pain, but it is recommended for subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence on the use of specific assessment tools to determine the prognosis of low back pain during psychological evaluation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

It is recommended that psychological interventions should not be a stand-alone therapy, but rather part of a combined treatment approach together with other specialties.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is evidence of increased risk of developing low back pain in work involving certain activities such as whole-body vibration, lifting and carrying heavy objects, pushing, and trunk flexion and/or twisting.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to keep the knees flexed during trunk flexion and weight lifting.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

In acute low back pain, performing scheduled workplace exercises reduces absenteeism.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

At work, lifting or carrying heavy loads—especially repetitively—constitutes a risk factor for low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to work in a correct seated position to prevent the development of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Imprecise

It is recommended to inform and educate the patient about postural hygiene measures (for example, the correct way to sit, lift heavy objects, sleep, and drive), as well as basic flexion exercises, in order to limit clinical manifestations of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is evidence that in patients with poor physical condition and lack of spinal flexibility, the risk of low back pain increases.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Adequate and continuous physical activity is recommended to prevent low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Patient expectations and preferences should be taken into account when prescribing a treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

However, patient expectations and preferences cannot take precedence over the best therapeutic option based on scientific evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Among adjuvant therapeutic options, an exercise program, physical therapy, or acupuncture may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In the absence of therapeutic response, it is recommended to reconsider the diagnosis and conduct a psychiatric, psychological and occupational health evaluation, as appropriate for the patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The physician should conduct a focused history and physical examination to classify the patient with low back pain into one of three categories: nonspecific low back pain, low back pain associated with radiculopathy and low back pain associated with specific systemic disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

From the first medical consultation, it is recommended to evaluate the location of low back pain, its triggering factors, exacerbating and relieving factors, radiation, pain severity, duration of symptoms and functional limitation, while also investigating occupational and psychosocial risk factors and warning signs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to take a detailed history and perform a focused physical examination in patients with low back pain. Patient age, sex, occupation, and duration of symptoms should be considered: acute <6 weeks, subacute 6–12 weeks, and chronic >12 weeks. The type of pain (mechanical and/or inflammatory) and signs of neurological compromise should also be investigated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The intensity of low back pain can be measured using the Visual Analogue Scale.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The degree of functional disability due to low back pain can be quantified using the Oswestry Disability Questionnaire.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Age >50 years, unexplained weight loss, history of cancer or lack of improvement with conservative treatment increase the risk of low back pain secondary to tumour. The absence of these four signs rules out cancer (100% sensitivity).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

It is recommended to suspect low back pain associated with neoplasia in patients over 50 years of age, with a history of cancer, weight loss, no improvement after 4–6 weeks, continuous or progressive pain, pain at rest, and nocturnal pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A complete neurological examination should be performed in the presence of pain and other neurological symptoms in the lower limbs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Urinary retention (90% sensitivity and 95% specificity) and saddle anaesthesia are the most useful signs for the diagnosis of acute cauda equina compression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

It is recommended to investigate the presence of urinary retention, reduced sphincter tone, bilateral leg pain, sensory-motor deficit and saddle anaesthesia in patients with low back pain due to cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

It is recommended to investigate the following red flags in patients with low back pain: age >50 years, history of neoplasia, body habitus, lack of improvement with standard treatments, pain at rest, fever, immunosuppression, previous trauma, osteoporosis, steroid use, and cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

The Lasegue test has a sensitivity of 91% and specificity of 26% for the diagnosis of radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Waddell's signs help differentiate organic pain from non-organic pain, such as psychogenic pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

The presence of motor deficit (paresis) provides high specificity (93%) for the diagnosis of radicular compression; however, it is important to note that most patients present only sensory fibre involvement, such as pain and hypoesthesia in a defined dermatome and therefore do not develop motor deficit.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to perform a neurological examination including the Lasegue test, assessment of sensation, muscle strength, and reflexes in patients with irradiated low back pain or neurological symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Routine imaging studies or other diagnostic tests (MRI, CT) are not recommended in patients with acute nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Imaging studies are recommended to detect possible underlying pathologies in patients being considered for surgery or epidural steroid injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Spinal X-ray does not rule out the presence of neoplasia or infection in patients with high suspicion, because the test has low sensitivity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In general, anteroposterior and lateral lumbar spine radiographs are not useful in acute low back pain, although they may be considered in patients with fever >38 °C for more than 48 hours, osteoporosis, systemic disease, sensory or motor deficit, chronic steroid use, immunosuppression, clinical suspicion of ankylosing spondylitis, accident or trauma, patients over 50 years of age, and in the absence of response to usual treatment for more than 4–6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended to request lumbar spine radiographs in anteroposterior and lateral projection, with the patient standing and without shoes, in cases of low back pain with suspected serious pathology such as cancer or infection, and when history and physical examination identify red flags.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Radiographs should be assessed for: alterations in vertebral curvature and shape such as scoliosis; fractures; spondylolisthesis; changes in intervertebral spaces; narrowing of foramina; presence of osteophytes; differences in iliac crest height; and abnormalities in soft tissues.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to request complementary studies in patients with low back pain based on a complete and individualized clinical evaluation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients without red flags, substituting radiography with MRI as the imaging test does not improve outcomes in terms of disability, pain, or resource utilization.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Radiography in acute low back pain is generally not necessary unless there is a clear history of trauma or the presence of yellow and red flags.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Imaging studies such as radiography, MRI and CT are not recommended in patients with acute low back pain without red flags.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Diagnostic studies are recommended in patients with low back pain when severe or progressive neurological deficits are present, or when there is suspicion of a specific disease, based on information obtained from clinical history.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The prevalence of abnormal MRI findings in asymptomatic individuals is high (28–36%) and increases with age.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to request MRI and CT in patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis. This indication should be considered in patients who are candidates for invasive interventions such as surgery or epidural steroid injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

MRI and CT are not recommended in cases of acute nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended that in patients with low back pain who do not respond to treatment after 4–6 weeks of evolution, a re-evaluation of clinical data be carried out, including occupational factors, treatment adherence, targeted search for red flags and assessment of the usefulness of imaging studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A complete blood count, erythrocyte sedimentation rate, and other laboratory tests should be performed in patients with well-founded clinical suspicion of inflammatory-infectious or systemic low back pain and/or the presence of red flags.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The goal in the management of a person with chronic low back pain should focus not only on relieving the painful symptom but also on preventing disability and/or incapacity. Specific objectives include restoring function and enabling conditions for all activities, including work, which requires the participation of a multidisciplinary team to carry out a comprehensive evaluation and management of the patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Absolute bed rest is generally not necessary in acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Relative rest is recommended, especially by reducing physical and sports activity, until symptoms remit.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Absolute bed rest is recommended for patients with disabling acute low back pain for 2 or 3 days, followed by relative rest.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Conflicting, individual

In patients with acute, subacute or chronic low back pain, it is recommended to continue daily life activities and maintain activity, including return to work as long as pain allows.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In patients with severe pain radiating to the lower limbs, bed rest limited to no more than 2 days is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Bed rest for more than 4 days in acute low back pain is not recommended, as it may trigger muscle tone disorders.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limit bed rest, individual

Rehabilitation is recommended in patients with acute low back pain to decrease or eliminate pain, support return to physical, occupational, and sports activities and prevent recurrence and chronicity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Biopsychosocial multidisciplinary rehabilitation reduces pain, improves function in patients with chronic low back pain, facilitates return to work and reduces absenteeism.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Local heat reduces pain and disability in the short term in acute and subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to apply local heat for pain relief in patients with acute and subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of heat is not recommended in cases of sensory disturbances, pressure ulcers, coagulation disorders and neoplastic processes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Superficial heat, such as hot moist compresses and infrared rays, is recommended in neoplastic processes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Insufficient evidence

The application of local cold is not recommended in acute and chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is low evidence supporting electrotherapy treatments in subacute and chronic low back pain, such as laser, interferential currents, ultrasound and TENS; their use is left to the specialist's discretion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no clear evidence supporting the use of TENS for the treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The use of TENS is not recommended as a routine treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Massage alone is not more effective than other active treatments in acute, subacute, and chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Massage reduces pain and increases functional capacity when combined with exercise and self-care in patients with subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Massage is recommended in subacute and chronic low back pain for short-term reduction of pain and disability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In chronic low back pain, consistent results are lacking when comparing massage with active treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Massage is not recommended as a stand-alone therapy in acute, subacute, and chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is a low risk of adverse effects from massage in nonspecific low back pain, such as superficial infection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Traction is not recommended in low back pain with or without sciatica, as there is low evidence supporting its effectiveness.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is evidence that acupuncture reduces pain and improves subacute and chronic low back pain; however, the evidence is weak to recommend it as a routine method.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Acupuncture is recommended in chronic low back pain, as therapeutic benefits have been reported in neuropathic pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is a significant reduction in pain and an improvement in functional capacity, both short- and long-term, in patients with acute low back pain who remain active compared to those who rest. The duration of work disability and the risk of chronicity are also lower in those who maintain activity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

It is recommended to perform low-impact physical activity to reduce the risk of low back pain, within the limits of the patient's symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In patients with low back pain lasting more than 4 weeks, an exercise program reduces pain and disability at 3 months, although these benefits are not maintained long term.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

There is no evidence regarding the most appropriate type of exercise or the duration of exercise in subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Aerobic exercise is as effective as other conservative treatments in reducing pain and improving functional capacity in patients with chronic low back pain. These programs are generally individualized.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Strengthening exercises for trunk muscles, especially spinal extensors with gradual progression, are recommended in patients with acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Pilates exercises 2–3 times per week for 3–6 months are recommended to reduce pain and improve functional capacity in chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Strengthening exercises for abdominal and lumbar muscles 2–3 times per week are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

A supervised exercise program is recommended in the management of chronic low back pain, using stretching and strengthening exercises and high-dose therapeutic interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Exercise shortens the number of disability days in people with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Physical activity is recommended to prevent recurrence of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In subacute and chronic nonspecific low back pain, physical activity is recommended as a fundamental basis of treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Any activity or exercise that increases symptoms should be discontinued. Aerobic exercise programs with minimal lumbar load, such as walking, cycling or swimming, can be initiated within the first 2 weeks in most patients with acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with chronic low back pain, it is recommended to improve physical condition to reduce the risk of exacerbation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Williams-type exercises are recommended daily in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The frequency and number of repetitions of Williams-type exercises will depend on the particular circumstances of each patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Evidence indicates that McKenzie exercises have positive effects in the treatment of low back pain; however, only a small percentage of patients benefit from them.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

McKenzie exercises are recommended for low back pain during the first three months of treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of lumbar belts is not recommended for the prevention of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Prolonged use of support belts predisposes to hypotrophy and atrophy of the abdominal and lumbar muscles.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of insoles is not recommended for the prevention of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence regarding the effectiveness of lumbar supports in reducing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence that chiropractic manipulation is more effective than other therapies for acute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Spinal manipulation should be performed by a licensed professional.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Manipulation may provide short-term benefits but is not more effective than usual medical treatment; it is considered an alternative management option.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Manipulation is not recommended in patients with severe or progressive neurological deficits, osteoporosis, fractures, cancer, infections, circulatory problems, poor general condition, or immunosuppression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

An occupational health evaluation of the patient in their work environment is recommended in order to prevent recurrences of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

At the start of pharmacological treatment, the following aspects should be taken into consideration: patient age, comorbidities, diet, drug interactions, cardiovascular and renal function, as well as, in certain cases, the prescription of gastric mucosal protectors in order to prevent complications associated with the administration of NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

For the treatment of acute, subacute, and chronic low back pain, paracetamol (acetaminophen) is recommended as the first-line drug, since its analgesic efficacy is similar to that of NSAIDs, but with a better risk/benefit profile.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

When paracetamol is insufficient for pain relief, an NSAID may be used, provided there are no contraindications and treatment does not exceed 14 days.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is insufficient evidence of greater efficacy of NSAIDs compared to paracetamol in the treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is no risk of gastrointestinal bleeding with the use of paracetamol. There is sufficient evidence of the safety of paracetamol at doses ≤ 2 grams.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence of differences in analgesic efficacy among different NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Conflicting evidence

In patients with chronic low back pain, the use of paracetamol is recommended, with the option of combining it with minor opioids and neuromodulators (anticonvulsants or tricyclic antidepressants), since chronicity implies that the pain has a neuropathic rather than an inflammatory component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If acute low back pain persists after initiating treatment with paracetamol or NSAIDs, it is recommended to consider adding a minor opioid at initially low doses to minimize adverse effects such as drowsiness, dizziness, and nausea.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

NSAIDs are recommended for short periods or at the lowest possible dose (minimum effective dose) as second-line drugs in the treatment of acute and subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The use of ibuprofen at doses below 1200 mg/day is recommended, as it is associated with a lower risk of serious gastrointestinal complications compared to other NSAIDs, such as peptic ulcer disease, bleeding, and perforation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Outdated, resources

The safety profile of NSAIDs should be considered, particularly gastrointestinal risk and the individual risk factors (renal, cardiovascular, potential drug interactions) of each patient when selecting a NSAID.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Patients should be advised to take NSAIDs with food and at the recommended doses. The prescription of gastric protectors is recommended in patients at risk for gastrointestinal bleeding.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The use of NSAIDs for more than 10 days is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The risks of NSAID and COX-2 inhibitor side effects should be emphasized, especially in elderly patients and those at risk of adverse events.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The isolated use of minor opioids in mild or moderate acute low back pain as initial treatment is not recommended, since it has not been shown to be more effective than therapeutic regimens with paracetamol or NSAIDs, and because of their more frequent adverse effects such as nausea, dizziness, drowsiness and headache.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The prudent and responsible use of opioids may be considered for carefully selected patients with severe acute low back pain not controlled with paracetamol and/or NSAIDs, at the minimum effective dose and for a limited period of time, generally less than one to two weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The use of muscle relaxants is recommended in patients with acute low back pain and intense muscle spasm, for a duration of 3 to 7 days and no more than 2 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no evidence that muscle relaxants are more effective than NSAIDs in the treatment of acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Non-benzodiazepine muscle relaxants are more effective than placebo in reducing pain in the treatment of acute low back pain. Evidence for benzodiazepine drugs is less consistent.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Most muscle relaxants reduce pain and are equally effective among themselves; however, their administration is associated with drowsiness, dizziness, and dependence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

There is insufficient evidence comparing the relative value of cyclobenzaprine against paracetamol and NSAIDs in the treatment of low back pain, nor that it adds therapeutic benefit in its management. Its risk/benefit profile is unfavourable.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of cyclobenzaprine for the management of low back pain is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

There is evidence that noradrenergic, serotonergic, and anticonvulsant antidepressants are effective in relieving neuropathic pain in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Tricyclic and heterocyclic antidepressants, at antidepressant doses, may be considered in patients with chronic low back pain who have failed conventional treatments. Their side effect profile should be considered before prescription, and their therapeutic effect is achieved only after 3 to 4 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The use of antidepressants or anticonvulsants in the management of acute low back pain is not recommended, as it is an inflammatory (self-limiting nociceptive) process.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In patients with subacute low back pain and yellow flags, the use of neuromodulators (antidepressants or anticonvulsants) should be individually evaluated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The use of systemic steroids is not recommended in the treatment of nonspecific and/or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Facet joint blocks with steroids are effective in reducing pain in subacute and chronic low back pain, exclusively when facet arthrosis is present. Their effect generally lasts 4 to 6 months and may also be considered as a diagnostic test.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Vitamin B is not recommended in the treatment of nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to evaluate the efficacy of capsaicin and transdermal local anaesthetics in patients with acute and subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Topical adverse effects of capsaicin are frequent, such as erythema, burning and pruritus. These are associated with poor treatment adherence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of capsaicin and transdermal local anaesthetics is recommended in patients with chronic low back pain of moderate to severe intensity who have not responded to other treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Infiltrations of any type are not recommended for acute, subacute or chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	41%
Use in the appropriate context:	No
Comments:	Outdated

There is low evidence regarding the effectiveness of facet, radicular, and intradiscal blocks for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of epidural blocks is recommended in specific acute low back pain associated with a radicular component, as they may accelerate pain relief.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Caudal and facet blocks are not recommended in patients with subacute or chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Trigger point infiltrations may be indicated in myofascial pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended to refer patients with low back pain or radicular pain associated with red flags to secondary care for differential diagnosis and timely treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to refer patients with a diagnosis of cauda equina syndrome to secondary care.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

It is recommended to refer patients with radicular pain without red flags, such as neurological deficit persisting for more than 4–6 weeks without improvement despite adequate treatment, to secondary care.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to refer patients with diagnostic uncertainty and frequent recurrences without a demonstrable triggering factor to secondary care.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to refer patients with clinical features of inflammatory low back pain, arthritis, elevated acute phase reactants, and radiographic changes in the thoracolumbar spine and/or sacroiliac joints to rheumatology.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to refer patients with recurrent low back pain or chronic low back pain >12 weeks to rehabilitation specialists.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended to refer patients to neurology if they present with more than 6 weeks of chronic pain with atypical characteristics, or with new or progressive neuromotor deficit.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Patients who are workers with more than 6 weeks of disability, and in whom a greater or prolonged incapacity must be verified, should be referred to occupational medicine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Spinal fusion should be reserved for a selected group of patients who have clinical and radiographic evidence supporting the need for this procedure and in whom conservative therapy has failed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

It should be noted that serious adverse events of surgery occur in 1–2%, while less severe effects are considered within the cost–benefit ratio

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

There is some evidence of benefit for pain relief with facet denervation using radiofrequency; however, further research is required.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of implants during lumbar spine surgery is at the discretion of the spine surgeon.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Pain episodes improve rapidly, but persistence of residual symptoms is common. Low back pain follows a more fluctuating course than a self-limiting and benign one.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

A previous episode of low back pain is associated with chronicity and recurrence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The presence of depression in patients with acute nonspecific low back pain increases the likelihood of chronicity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

During follow-up of patients with low back pain, it is important to clearly inform them about the good prognosis of the condition, the absence of serious pathology, the limited usefulness of radiographs, and the importance of maintaining physical activity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In patients with acute, subacute or chronic low back pain, it is recommended to continue daily life activities, including return to work as long as pain allows.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with acute nonspecific low back pain, a follow-up visit 2 to 4 weeks after starting treatment is recommended, in order to evaluate therapeutic response.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Patients should be instructed about follow-up, including attending consultation if there is no improvement with established treatment, or in the presence of persistent, worsening, or progressive severe pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with acute low back pain, in the absence of cauda equina syndrome, conservative treatment for 4 to 6 weeks is appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Probably effective preventive interventions include: physical activity, aerobic exercise, strengthening of back extensor muscles, evaluation of psychosocial factors, and assessment of job satisfaction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The physician is recommended to identify risk situations and provide specific measures to reduce the risk of chronicity in cases of slow improvement of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Acute low back pain with a positive Lasegue sign on physical examination is associated with inflammatory neurological injury and prolongs days of disability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

A previous episode of low back pain is associated with recurrent pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Recurrent disability is associated with chronicity of low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Age over 50 years is associated with delayed return to work and chronicity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Poor work adaptation and high physical demands at work are related to delayed return to work.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

Before determining the number of disability days in a patient, the following predictors of chronicity should be considered: previous episodes of low back pain, age >50 years, radiating pain with positive Lasegue sign, disability caused by pain at onset, depression, poor adaptation to work or high physical work demands.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Early return to work is recommended, combined with analgesic treatment, patient information and education regarding the course and treatment of low back pain and, when possible, maintaining regular contact with employers on ways to ensure a safe return to work. Planning the return to work reduces the risk of job loss.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

To evaluate the time of return to work, the level of activity, pain intensity and type, patient age and preventive workplace measures should be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Granting more than 2 days of disability leave to patients with acute nonspecific low back pain is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In patients with chronic low back pain, determination of disability leave duration requires an individualized decision, considering the aetiology and in consultation with occupational medicine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Red flag signs in low back pain include: age over 50 years, history of neoplasm, wasting syndrome without improvement with usual treatments, pain at rest, fever, immunosuppression, previous trauma, osteoporosis, corticosteroid use, and cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No recommendation
Comments:	No recommendation

The use of laboratory tests or imaging (X-ray, CT scan, MRI) is not recommended in patients with acute or subacute low back pain without red flag signs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Bed rest is not recommended in patients with acute or subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with acute or subacute low back pain, it is suggested to continue physical activity and maintain activities of daily living, including work activities, as much as possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The implementation of back school programs is not recommended for patients with acute or subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Manual therapy involving manipulation and soft tissue mobilization, provided by a rehabilitation physician or physical therapist in a rehabilitation service, is recommended for the management of acute and subacute low back pain, according to service availability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

The use of lumbar supports (braces or corsets) is not recommended for the management of acute or subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The use of paracetamol, regardless of the dose, is not recommended as first-line monotherapy in the treatment of acute or subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

NSAIDs are suggested as first-line treatment for acute and subacute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is suggested to add a muscle relaxant if acute or subacute low back pain persists after initiating treatment with NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

The use of a weak opioid (tramadol, codeine) is suggested if acute or subacute low back pain persists after initiating treatment with NSAIDs and a muscle relaxant.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Europe

European guidelines for the management of chronic nonspecific low back pain (Working group on guidelines for chronic low back pain, 2006)

AGREE GRS: 4/6/5

We recommend that diagnostic triage is carried out at the first assessment and at reassessment in patients with chronic low back pain to exclude specific spinal pathology and nerve root pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We recommend the assessment of prognostic factors (yellow flags) in patients with chronic low back pain. The validity and relevance of these factors are discussed in the section on prognostic factors.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend spinal palpatory and range of motion tests in the diagnosis of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We do not recommend radiographic imaging for chronic nonspecific low back patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We recommend MRI in patients with serious red flags and for evaluation of radicular symptoms. Plain radiography is recommended for structural deformities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We do not recommend MRI, CT or facet blocks for the diagnosis of facet joint pain or discography for discogenic pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of EMG as a diagnostic procedure in chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We recommend that work related factors, psychosocial distress, patient expectations and extreme symptom reporting are assessed in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend interferential therapy as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend laser therapy for the treatment of patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the wearing of a lumbar support for the treatment of nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend shortwave diathermy as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend therapeutic ultrasound as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend thermotherapy/heat as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We cannot recommend lumbar traction as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We do not recommend TENS for the treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

We recommend supervised exercise therapy as a first-line treatment in the management of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	90%
Use in the appropriate context:	Yes
Comments:	None

We advocate the use of exercise programmes that do not require expensive training machines. The use of a cognitive-behavioural approach, in which graded exercises are performed, using exercise quotas, appears to be advisable. Group exercise constitutes an attractive option for treating large numbers of patients at low cost. We do not give recommendations on the specific type of exercise to be undertaken (strengthening/muscle conditioning, aerobic, McKenzie, flexion exercises, etc.). The latter may be best determined by the exercise-preferences of both the patient and therapist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Consider a short course of spinal manipulation/mobilisation as a treatment option for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

We cannot recommend massage therapy as a treatment for chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	66%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We do not recommend back schools as a treatment for chronic low back pain when aiming at long-term effects (>12 months).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

We recommend brief educational interventions, which can be provided by a physiotherapist or a physiotherapist and physician and which encourage a return to normal activities, to reduce sickness absence and disability associated with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We do not give recommendations on the specific type of brief educational intervention to be undertaken (face-to face, Internet-based, one-to-one, group education, discussion groups, etc.). The latter may best be determined by the available resources and the preferences of both the patient and therapist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We recommend cognitive-behavioural treatment for patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

We recommend multidisciplinary biopsychosocial rehabilitation with functional restoration for patients with chronic low back pain who have failed monodisciplinary treatment options.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Consider the use of noradrenergic or noradrenergic-serotonergic antidepressants as co-medication for pain relief in patients with chronic low back pain without renal disease, glaucoma, pregnancy, chronic obstructive pulmonary disease and cardiac failure.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Consider the use of muscle relaxants (benzodiazepines) for short-term pain relief in chronic low back pain, but use them with caution due to their side effects (drowsiness, dizziness, addiction, allergic side-effects, reversible reduction of liver function, gastrointestinal events). As they do not appear to exert their effect by reducing muscle spasm, other pain relieving drugs with fewer serious side-effects should be considered first.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We recommend NSAIDs for pain relief in patients with chronic low back pain. Because of the side-effects, NSAIDs should only be used for exacerbations or short-term periods (up to 3 months).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

We recommend the use of weak opioids (e.g. tramadol) in patients with nonspecific chronic low back pain who do not respond to other treatment modalities. Due to the risk of addiction, slow-release opioids are preferable to immediate-release opioids, and should be given regularly (around the clock) rather than as needed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We cannot recommend the use of gabapentin in patients with nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Consider capsicum pain plasters for short-term symptomatic pain relief in chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We cannot recommend acupuncture for the treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

We cannot recommend the use of epidural corticosteroids in patients with non-radicular, nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

We cannot recommend the use of intra-articular injections of steroids or facet nerve blocks in patients with nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

We do not recommend the use of intradiscal injections for the treatment of chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of botulinum toxin for the treatment of chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of sacroiliac joint injections with corticosteroids for the treatment of nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	86%
Use in the appropriate context:	Yes
Comments:	None

We do not recommend the injection of sclerosants (prolotherapy) for the treatment of nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	88%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of trigger point injections in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Consider neuroreflexotherapy for patients with moderate or severe (≥ 3 points on a Visual Analogue Scale) low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	60%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Consider PENS for symptomatic pain reduction in patients with chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	60%
Use in the appropriate context:	Yes, modifications
Comments:	Short term, individual

We cannot recommend radiofrequency facet denervation for patients with nonspecific chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

We cannot recommend the use of intradiscal radiofrequency, electrothermal coagulation or radiofrequency denervation of the rami communicans for the treatment of either nonspecific or 'discogenic' low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	86%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of radiofrequency lesioning of the dorsal root ganglion to treat chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend the use of spinal cord stimulation for the treatment of chronic nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	84%
Use in the appropriate context:	Yes
Comments:	None

We cannot recommend fusion surgery for chronic low back pain unless 2 years of all other recommended conservative treatments have failed and combined programs of cognitive intervention and exercises are not available in the given geographical area.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Considering the high complication rates of surgery, as well as the costs to society and suffering for patients with failed back surgery, we strongly recommend that only carefully selected patients with severe pain (and with maximum 2 affected levels) should be considered for this procedure.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

European guidelines for the management of acute nonspecific low back pain in primary care (Working group on guidelines for the management of acute low back pain in primary care, 2006)

AGREE GRS: 4/6/5

Case history and brief examination should be carried out.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

If history taking indicates possible serious spinal pathology or nerve root syndrome, carry out more extensive physical examination including neurological screening when appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Undertake diagnostic triage at the first assessment as basis for management decisions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Be aware of psychosocial factors, and review them in detail if there is no improvement.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Diagnostic imaging tests (including X-rays, CT and MRI) are not routinely indicated for nonspecific low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Reassess those patients who are not resolving within a few weeks after the first visit, or those who are following a worsening course

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Give adequate information and reassure the patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Do not prescribe bed rest as a treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advise patients to stay active and continue normal daily activities including work if possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Prescribe medication, if necessary for pain relief; preferably to be taken at regular intervals; first choice paracetamol, second choice NSAIDs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Consider adding a short course of muscle relaxants on its own or added to NSAIDs, if paracetamol or NSAIDs have failed to reduce pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Consider (referral for) spinal manipulation for patients who are failing to return to normal activities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Multidisciplinary treatment programmes in occupational settings may be an option for workers with subacute low back pain and sick leave for more than 4–8 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

National clinical guidelines: Low back pain – with and without nerve root involvement (The Norwegian Communication Unit for Musculoskeletal Disorders, 2006)⁵

AGREE GRS: 4/5/5

It is recommended (moderate strength) to inspect gait, dressing and undressing, body language, posture, pain behaviour, and deformity/scoliosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended (moderate strength) to examine spinal mobility in lateral flexion, forward flexion, and extension: finger–floor distance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Palpation is recommended (weak/moderate strength), but adapted to the individual clinician's experience.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Nerve stretch tests are recommended (strong/moderate strength) to be performed in cases of radiating pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Neurological examination is recommended (strong/moderate strength) to be performed on the lower extremities when nerve root involvement is suspected.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Supplementary examinations are recommended (moderate/strong strength), depending on the clinical suspicion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Acute/subacute/chronic nonspecific low back pain: It is usually not necessary to refer for radiological investigation. In cases of persistent pain without signs of improvement beyond 4–6 weeks, radiological evaluation is recommended (moderate/weak strength), usually with MRI as the first choice. However, the investigation should be guided by the suspected condition.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Nerve root involvement without red flags: It is recommended (strong to moderate strength) to not perform initial radiological evaluation if the symptoms are improving and red flags are absent.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In cases of symptoms without improvement beyond 4–6 weeks, and especially if surgical treatment is being considered, MRI or alternatively CT should be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with a history of previous back surgery, MRI is the primary investigation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Follow-up of a confirmed disc herniation with CT or MRI is rarely indicated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Neurogenic claudication: MRI is the primary investigation method, especially if surgical treatment is being considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Myelography is not recommended as a primary investigation, but may exceptionally be performed as a supplementary preoperative test in cases of unclear findings, particularly to assess concordance between clinical presentation and CT/MRI findings of disc herniation or spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Radiological evaluation is strongly recommended, usually MRI, but the investigation should be guided by the suspected condition. The stronger recommendation is due to the presumed negative consequence of overlooking a treatable condition.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If MRI is contraindicated or unavailable, CT combined with conventional radiography may be used as an alternative.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Primarily, conventional radiography is recommended (moderate strength) when structural deformity, spondylolisthesis or sacroiliac joint arthritis is suspected, as well as when suspicion of a serious condition is relatively weak.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

We suggest conventional radiography as the primary investigation (weak strength) in cases of suspected fracture. CT should be used when nerve root involvement or neurological deficits are present or when a pars interarticularis fracture is suspected.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Nuclear medicine methods are rarely recommended as a primary investigation (moderate strength), but may be useful in cases of suspected fracture, tumour, infection or pseudarthrosis after fusion surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to advise patients to remain as active as possible with varied activities (including frequent changes of position, avoiding prolonged sitting or standing), and to continue or resume normal activities as soon as possible, including work. Reassure and inform patients about the usually favourable prognosis, and emphasize the presence of 'green' rather than 'red' flags. When sick leave is used, it is recommended (moderate strength) that it be kept as short as possible. This usually requires close follow-up, preferably with a new contact after 1–2 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

It is recommended (moderate strength) to advise patients to maintain normal daily activities, and to reinforce this message through a simple cognitive intervention (2–4 consultations) focusing on pain coping, reassurance, and guidance in self-help strategies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is strongly recommended to advise patients to be as active as possible and to participate in normal daily activities. Attention should also be directed toward the patient's fear and concerns.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Bed rest is not recommended (strong strength) as a therapy, but may be necessary initially for pain relief.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, time constraint

Specific exercises and training cannot generally be recommended (moderate strength) during the first weeks of the acute stage.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

It is strongly recommended to refer to cognitively based guided exercise (including addressing the patient's thoughts about training/activity) if patients have not resumed normal activities or returned to work after 4–6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Supervised exercises/training are strongly recommended as treatment for long-lasting low back pain. The training should be individually tailored with gradual progression and be cognitively based. The choice of exercises or type of training should be determined by the therapist's and patient's preferences, but the training should be performed systematically over time.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Manipulation therapy is strongly recommended to reduce pain and improve function (compared with no treatment). We recommend this for patients who need additional help and who, after some time, have not returned to normal activities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is no basis for giving a recommendation on manipulation alone, but manipulation may be included in combination treatment together with examination and advice from a specialist, exercises, massage, and injection therapy (moderate strength recommendation).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Manipulation is recommended (moderate strength) on par with other treatments for reducing pain and improving function. Due to conflicting evidence, there is no basis for recommending manipulation with respect to cost-effectiveness or for reducing sick leave.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Traction cannot be recommended as a treatment, either for acute or for long-lasting low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Back school with a cognitive approach: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Back school with a cognitive approach may be recommended (moderate strength) in the short term for patients with long-lasting back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The available evidence does not provide a basis for recommending massage as a stand-alone intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Massage is recommended (moderate strength) in combination with exercises if the complaints persist and enter a subacute phase (6–12 weeks).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Massage is recommended (moderate strength) as an intervention for long-lasting low back pain, but it should primarily be used in combination with exercise.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The available evidence does not provide a basis for recommendations regarding cold therapy, electrotherapy, therapeutic ultrasound or laser. However, a heating pad may be tried in cases of acute back pain (weak strength).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

TENS may be tried (weak strength) in acute back pain, but the evidence is limited to a single study.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Limited evidence

The available evidence does not provide a basis for a recommendation for TENS in chronic back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The available evidence does not provide a basis for a recommendation for acupuncture in acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Acupuncture is recommended (moderate strength) as an intervention for long-lasting low back pain. The effect is short-term and moderate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

A corset in acute or chronic low back pain: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

It is recommended (moderate strength) to start with paracetamol or NSAIDs if paracetamol has already been tried. If the pain is severe, the working group recommends initially choosing the combination preparation paracetamol/opioid or tramadol. In cases of unsatisfactory pain relief with paracetamol at the maximum daily dose of 4 g, an alternative type of pain treatment should be considered, since paracetamol overdose can cause permanent liver damage. NSAIDs generally have a less favourable side effect profile, particularly with long-term use. Of special concern is the increased risk of dyspepsia, gastrointestinal bleeding and cardiovascular side effects (notably with COX-2 inhibitors). The two preparations can be combined, but this recommendation is based on clinical experience.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For patients with long-lasting pain, NSAIDs are recommended (moderate strength), as they may provide modest pain relief during periods of exacerbation. The effect size diminishes over time and given the unfavourable side-effect profile, there is no basis for use beyond 4 weeks. Use of opioids in long-lasting low back pain should be restricted due to risk of dependence and limited documented effect. If the pain warrants it, analgesic medication is recommended (moderate strength) to be taken at regular intervals, not on an as-needed basis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended (weak strength) to give noradrenergic or noradrenergic-serotonergic antidepressants (for example, tricyclics) as co-medication for pain reduction in long-lasting low back pain (especially when depression is also present). European guidelines recommend the use of antidepressants for persistent nonspecific low back pain, but due to limited effect and frequent side effects, antidepressants are only recommended as co-medication, particularly when depression is present.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is recommended (weak strength) to consider surgery in the form of fusion in patients with severe lumbar back pain and localised degenerative disc disease. The pain should have persisted for more than 1–2 years, evidence-based multidisciplinary non-operative treatment and assessment must have been attempted, and the degenerative changes must not involve more than two levels. The considerable complication rate must be taken into account when weighing the indication for surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Acute sciatica: It is recommended (weak strength) that patients should be encouraged, due to the general benefit of physical activity, to remain in varied activity even if painful. However, activities that cause significant worsening of the pain radiating down the leg should be avoided.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If the patient drifts into a passive state, it is recommended (weak strength) to initiate light physical activity/exercises to avoid the adverse consequences of inactivity. Activities should be gradually intensified.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If the patient drifts into a passive state, it is recommended (weak strength) to initiate light physical activity/exercises to avoid the adverse consequences of inactivity. Activities should be gradually intensified.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Acute/chronic sciatica: Traction cannot be recommended (strong strength).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Acute sciatica: Manipulation should not be used (strong recommendation) in patients with severe or progressive neurological deficits.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Chronic sciatica: Manipulation is recommended (moderate strength) to achieve a moderate short-term effect in patients with long-lasting symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Acute sciatica: Individually tailored cognitive therapy is suggested (weak strength) when there is a risk of chronification and in patients with psychosocial risk factors.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended (moderate strength) to start with paracetamol. If paracetamol does not provide satisfactory effect, paracetamol/opioid combination preparations or tramadol may be used, which have comparable efficacy. In cases of severe pain, strong analgesic treatment with opioid combination therapy or tramadol is recommended initially. This recommendation is based on clinical experience, evidence from other pain conditions, and consensus in the working group. If paracetamol at the maximum daily dose of 4 g does not provide adequate effect, treatment should be switched to another type of analgesic, since overdose of paracetamol can cause permanent liver damage. Due to frequent side effects and risk of dependence, however, the threshold for initiating opioid treatment should be relatively high, and the treatment duration kept as short as possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

If indicated, analgesic medication is recommended (weak strength) to be taken at regular intervals and not on an as-needed basis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

NSAIDs cannot be recommended for nerve root pain due to documented lack of effect and adverse effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The available evidence does not provide a basis for recommending anti-tumour necrosis factor-alpha.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Immediate referral to a surgeon in case of cauda equina syndrome is strongly recommended due to the serious consequences of delay.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

It is recommended (strong strength) to refer for surgery after 6–12 weeks (or earlier if severe pain). Surgery is a treatment for the radicular pain itself. The strong recommendation (consensus) is given out of consideration for the patient's pain perspective, and not based on the level of documentation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Patients with an indication for surgery are recommended (moderate strength) to undergo surgery within 6–8 months, partly due to the risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Chemoneurolysis with chymopapain is recommended (weak strength) to be attempted in a subgroup of patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	53%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Transforaminal steroid injection is recommended (weak strength) as an option to be tried during the waiting period before surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

It is strongly recommended that patients be advised to resume/continue normal activity, including work, despite some pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is strongly recommended that patients be advised to stay away from work for as short a time as possible in order to improve the chances of returning to work.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended (moderate strength) that patients be supported in achieving reassurance regarding their pain condition (confidence that it is not dangerous), so that they are motivated to increase their level of function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Multidisciplinary rehabilitation initiated at the right time is good treatment for patients who are not candidates for surgery and is strongly recommended. Multidisciplinary back clinics are a good alternative. It is important to encourage collaboration with the workplace. In some patients, however, specialist assessment or referral to another profession may be sufficient before offering multidisciplinary treatment. Multidisciplinary intervention should be specifically targeted at those expected to benefit from such measures. The intervention may be of light, medium or intensive type.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is strongly recommended to discuss with the patient whether dissatisfaction at work is perceived as an important cause of the back problems

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended (moderate strength) to facilitate good communication between the employee, occupational health service and employer. Consider and discuss whether early graded or active sick leave is an option (even though there is no solid evidence that this overall reduces sickness absence).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Multidisciplinary cognitive rehabilitation is strongly recommended for patients with long-lasting back pain where other treatments have not provided sufficient results.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Men with long-lasting low back pain may benefit from multidisciplinary cognitive rehabilitation using a simple individual model in an outpatient back clinic. This is recommended (weak strength) due to limited evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A brief screening instrument can provide information about the patient's prognosis and help make treatment as differentiated and effective as possible. Recommended (moderate strength).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Facilitating good communication between the employee, health services, and employer is recommended (weak strength).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

There is no basis for recommending physical activity (moderate strength) as a primary preventive measure for low back pain, either as leisure activity or as exercise organized during working hours.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Exercises/training are recommended (strong strength) as a measure to prevent new episodes of back pain and to reduce future sick leave. Training can be carried out both at and outside the workplace.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Primary prevention: The available evidence does not provide a basis for a recommendation regarding inactivity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	47%
Use in the appropriate context:	No
Comments:	Outdated

Secondary prevention: Prospective studies suggest that overweight and smoking negatively affect prognosis, but there are no studies investigating whether weight reduction or smoking cessation improve prognosis. The available evidence therefore does not provide a basis for recommending modification of these risk factors.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated

Working postures, work techniques, aids (lifting devices, etc.), furniture / workplace adaptations: Primary prevention: No recommendation can be made due to insufficient evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Shock-absorbing insoles, floors, mats: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Tertiary prevention: The evidence is limited and the intervention cannot be recommended for back patients in general, but shock-absorbing insoles may be recommended (weak strength) for patients who walk long distances at work.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Non-slip flooring: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Multidimensional ergonomic measures: Primary/secondary prevention: Composite interventions are recommended (moderate strength) to prevent low back pain and recurrences, but the interventions must address a specific problem (for example lifting) identified in the workplace and involve the employees. The available evidence does not provide a basis for recommending prioritization or weighting of the individual measures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Organizational measures in the workplace: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Information, advice, education, psychosocial measures: Primary prevention: The available evidence does not provide a basis for recommending the above measures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Back school: Primary prevention: The evidence in this area is limited. Back school programs based on biomedical and mechanical theory do not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Secondary prevention: Intensive back school including ergonomic education/skills training, cognitive components, and exercises/training is recommended (moderate strength) for patients with recurrent low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Manipulation (regularly over time): Secondary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Primary and secondary prevention: Support belts/corsets likely have little or no effect and can therefore not be recommended. This applies both in the workplace and in the general population.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated

Leg length discrepancy/leg length correction: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Correction of foot position: Primary prevention: Insoles for correction of foot position cannot be recommended as a primary preventive measure.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Chairs (recliners and work chairs): Primary and secondary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Mattresses: Primary and secondary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

School desks: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

School backpacks: Primary prevention: The available evidence does not provide a basis for a recommendation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Appropriateness of diagnosis and surgical treatment of symptomatic lumbar disc herniation (Italian Society of Spinal Surgery, 2008)⁵

AGREE GRS: 4/6/5

The attending physician must carefully take the patient's history and perform a physical examination in cases of simple low back pain or pain with radiation. Particular attention should be paid to symptoms (sciatica and pain radiating below the knee) that have good diagnostic accuracy for lumbar disc herniation. Above all, symptoms and signs suggestive of red flags must be identified, as they may indicate systemic, inflammatory, neoplastic, or infectious diseases, as well as cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Considering the high frequency of asymptomatic disc herniations and the possible regression of symptomatic herniations, it is advisable to wait at least 4–6 weeks from the onset of symptoms (low back pain, radiculopathy, and functional limitation) in the absence of red flags before performing diagnostic imaging. CT or MRI, however, should be carried out urgently in cases of suspected systemic, neoplastic, or infectious disease, as well as suspected cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

CT or MRI is recommended, after 4–6 weeks of conservative treatment, in patients with symptoms or signs of radicular compression sufficiently severe to warrant consideration of surgical intervention, also taking into account the individual patient's preferences.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Although CT and MRI (when performed with state-of-the-art equipment) are nearly equivalent in terms of diagnostic capability for lumbar disc herniation, MRI is preferable because it does not involve exposure to ionizing radiation (particularly concerning for women of childbearing age), allows diagnosis of intradural lesions, and provides superior panoramic imaging. The choice of imaging modality, however, also depends on contextual factors and locally available resources.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Plain radiography of the spine is not indicated as a routine examination in patients with radicular pain, except in cases of suspected fracture or vertebral collapse.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In certain cases (for example, if MRI reveals spondylolisthesis), further diagnostic work-up with standard and/or dynamic radiographs of the lumbosacral spine may be indicated, also to support proper surgical planning.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Spinal and pelvic radiographs, and possibly MRI, are indicated in patients with low back pain and/or 'truncated' sciatica suggestive of ankylosing spondylitis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is insufficient evidence to recommend routine electrophysiological testing, including evoked potential studies, except in cases specifically selected by a specialist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For the diagnosis of lumbar disc herniation, there is no indication to perform CT or MRI with intravenous or intrathecal contrast administration. The use of contrast agents is justified only in patients who have previously undergone surgery or in cases of suspected intradural pathology.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Clinicians responsible for the management of patients undergoing imaging for back pain must correlate the information in imaging reports with the clinical situation, explaining that radiological findings of asymptomatic disc protrusions are common.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Cauda equina syndrome due to intervertebral disc herniation represents an absolute indication for urgent discectomy, to be performed within 24 hours if possible and no later than 48 hours from symptom onset.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The development of progressive motor deficit in a patient with confirmed lumbar disc herniation requires consideration of surgical intervention, although it does not represent an absolute indication.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

With regard to elective indications, surgical intervention should be considered in cases where there is concordance between the patient's reported symptoms (dermatomal distribution of pain and paraesthesia; the objective clinical findings (clinical tests and reflexes corresponding to the affected root) and the instrumental diagnosis (radiological and, if necessary, neurophysiological) confirming the level of disc involvement. The absence of such concordance should be regarded as a contraindication to surgery and requires a re-evaluation of the diagnosis and the use of less invasive treatment techniques.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In cases where there is concordance between symptoms, clinical signs, and diagnostic imaging, surgical intervention should be considered when all of the following criteria are present: symptoms lasting longer than six weeks, persistent pain unresponsive to analgesic treatment, failure, in the joint judgment of the patient and the surgeon, of adequately conducted effective conservative treatments. There is insufficient evidence to establish a maximum duration for conservative treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The patient must be involved in the decision-making process and adequately informed about the natural history of the disease and the available therapeutic alternatives. The patient's informed choice may, in exceptional cases, justify surgical intervention even before six weeks, such as in cases of intractable 'hyperalgesic' sciatica resistant to all analgesic therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The possible presence of severe concomitant spinal conditions (spinal canal stenosis, spondylolisthesis, vertebral instability) must be carefully considered when deciding whether or not to perform discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In cases where imaging has consisted solely of MRI and the findings suggest degenerative stenosis (of the central canal and/or lateral recesses/neural foramina) or sagittal plane misalignment, it is advisable—when preparing for possible surgery—to complete the imaging assessment with CT (to evaluate the osseous and articular components) and/or with dynamic standing radiographs (lateral views in flexion and extension).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Relative contraindications to discectomy for lumbar disc herniation include the concomitant presence of severe diffuse degenerative spinal disease or peripheral neuropathies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

There is conflicting evidence that patients with a low level of education and those with active psychopathological disorders may derive less benefit from surgical treatment. It is therefore recommended to consider psychological assessment of patients at the time of surgical triage.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The limited evidence regarding the role of age as a factor influencing surgical prognosis suggests exercising additional caution when considering surgical treatment in older patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Considering that the long-term effectiveness of discectomy is comparable to that of conservative treatment, and that the majority of patients with symptomatic lumbar disc herniation recover spontaneously, clinicians responsible for patient management must provide comprehensive information about the natural history of the condition, the effectiveness of surgical treatment, and the available therapeutic alternatives. This ensures that the patient can make a conscious and appropriate treatment choice in line with their lifestyle and personal preferences.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Information regarding the limited long-term effectiveness of discectomy compared with conservative treatments should also be clearly stated on the informed consent form.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Standard discectomy or microdiscectomy represent the surgical techniques of choice.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	No
Comments:	Outdated, endoscopic

Based on the insufficiency of available evidence, automated percutaneous discectomy with laser or coblation is not recommended, except within the context of experimental clinical studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

Given the insufficiency of existing evidence, discectomy combined with partial or total disc replacement is not recommended for patients undergoing their first surgery for lumbar disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

Chemonucleolysis procedures are not advisable, given their reduced effectiveness compared with discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Insufficient effect

Given the uncertainty regarding effectiveness, epidural steroid administration may be performed only within the context of randomized controlled trials aimed at assessing its effect.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated

Given the lack of evidence supporting epidural, paravertebral or intradiscal administration of oxygen–ozone mixtures, their use is not recommended outside randomized controlled clinical trials designed to evaluate their effect.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

The use of paracetamol or NSAIDs is recommended to reduce painful symptoms, but only for limited periods of time. It should not be forgotten that NSAIDs may cause serious side effects, particularly in elderly patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Paracetamol combined with weak opioids, as well as tramadol, may represent an effective alternative to NSAIDs or paracetamol alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Systemic steroids may be used for short periods.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, risk-benefit

With regard to the choice of anaesthesia, in the absence of specific evidence for disc herniation surgery—and considering that general anaesthesia is by far the most commonly used—its use is recommended for discectomy procedures according to good clinical practice criteria. However, the experience of the anaesthesiologist and the surgeon remain the main factors determining the choice of anaesthesia type and the patient’s positioning during discectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Performing surgery in the knee–chest position requires the use of a dedicated frame (for example, the Andrews frame), while in the prone position specific frames such as the Wilson frame, or appropriately padded supports for the chest and pelvis, are used to keep the abdomen elevated and thereby prevent venous stasis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

The prone position is inherently associated with complications, particularly peripheral nerve injuries due to stretching and compression (brachial plexus, ulnar nerve). It is therefore recommended that all appropriate protective measures be systematically applied.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Discectomy is not usually associated with particularly significant postoperative pain. Nevertheless, a simple analgesic measure is to ensure a comfortable (semi-supine) position starting immediately upon awakening.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Given the risk of infectious complications after discectomy and based on the proven effectiveness of prophylaxis against surgical wound infection, antibiotic prophylaxis is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Administration of a single perioperative dose of first-generation cephalosporins represents the recommended antibiotic prophylaxis, based on criteria of effectiveness, safety and cost.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Geographical, resources

There is evidence to recommend against the routine use of antithrombotic prophylaxis in low-risk patients undergoing lumbar discectomy for intervertebral disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Thromboprophylaxis is indicated in the presence of associated thromboembolic risk factors. In cases of moderate risk (such as previous deep vein thrombosis, cancer, thrombophilic molecular conditions, or use of oestrogen-containing oral contraceptives), low-dose heparin—preferably low-molecular-weight—may be used, and/or graduated compression stockings and intermittent pneumatic compression systems.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In cases of high risk, defined as age over 60 years or between 40 and 60 years in association with additional risk factors, high-dose heparin—preferably low-molecular-weight—should be used, and/or intermittent pneumatic compression systems.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The possible presence of non-organic factors may be suggested—either at the onset of the clinical picture or in cases of prolonged pain and disability—by the so-called Waddell test.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The presence of psychosocial factors should be assessed if symptoms do not improve within 4–6 weeks of onset, alongside re-evaluation for possible red flags, diagnostic imaging, and specialist consultations. Psychosocial factors may represent potential determinants of surgical overtreatment and of the risk of symptom chronicity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The psychometric tools to be used for psychological assessment are the Minnesota Multiphasic Personality Inventory for the somatic component and the Beck Depression Inventory or the Zung Self-Rating Scale for mood evaluation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Geographical, individual

Given the conflicting evidence on the effectiveness of intraoperative treatments for preventing epidural fibrosis, and on the relationship between fibrosis and clinical outcomes, the use of gels or autologous fat in the epidural space during discectomy for lumbar disc herniation is not recommended outside experimental clinical studies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Insufficient evidence

It is not advisable to restrict physical activity in patients after their first surgery for lumbar disc herniation, also in order to facilitate early return to work when this is not associated with an occupational risk of disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

After the first surgical procedure for lumbar disc herniation, an intensive physiotherapy rehabilitation program should be carried out, to be initiated within 4–6 weeks after surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Physiotherapy, as part of the comprehensive management of the patient, should be initiated as early as possible after surgery and, when feasible, even in the preoperative phase.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no evidence to recommend any specific type or modality of rehabilitation program (supervised or home-based).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

There is insufficient evidence to recommend a specific care setting for the various discectomy procedures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Treatment of degenerative cervical spondylosis with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery (The Polish Society of Spinal Surgery, 2016)

AGREE GRS: 4/5/5

In a vast majority of cases, worsening of pain in degenerative cervical spondylosis with radiculopathy should significantly decrease without treatment in 4–6 months.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	Yes, modifications
Comments:	Limited low-quality evidence

In a majority of the patients, surgical treatment is effective in the treatment of radicular pain in the course of degenerative cervical spondylosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Evidence for superiority of surgical treatment over conservative treatment two years after operation is lacking. Surgical treatment probably provides a faster recovery and shortens the pain duration.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

No precise recommendations for surgical treatment and favourable predicting factors can be created.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Surgical treatment of radiculopathy in degenerative cervical spondylosis is effective both in medium and long-term observation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Both anterior discectomy and posterior foraminotomy are effective treatment methods in degenerative cervical spondylosis with radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

No scientific evidence on advantage of any method was identified. One article pointed to significantly lower cost of posterior foraminotomy with similar therapeutic effect.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence; Individual

Both single-level anterior cervical discectomy (ACD) and ACDF are effective treatment methods of degenerative cervical spondylosis with radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Using fixation plate in single level ACDF reduces kyphotisation with no effect on the outcome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	66%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

No advantage of ACD over ACDF can be proven.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Either short-term, medium or long-term outcomes of arthroplasty are subtly better in comparison with ACDF. The difference, while statistically significant, has probably no clinical relevance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

There is no evidence proving lower incidence of disorders at nearby segments in patients treated with arthroplasty when compared with ACDF.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Long term uncertainty

Treatment of lumbar disc herniation with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery (The Polish Society of Spinal Surgery, 2016)

AGREE GRS: 4/5/5

In particular patients, short-term result of surgical treatment is better when compared with conservative treatment. Patients, who improved after surgical treatment, fit the pattern: pain radiating consistently with the level of herniated lumbar disc-nerve conflict, positive stretch test (straight leg raising test positive at 10–45°), convincing diagnostic imaging (level, side).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Based on literature analysis, there is no clear evidence favouring surgical treatment over conservative treatment in longer observation (longer than 1 year).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Longer delay from the onset of symptoms to surgical treatment is associated with worse outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The threshold period after which the treatment outcome is significantly worse is 6 months.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Better outcome can be expected in patients younger than 40, with severe pain radiating to the leg, and when the symptoms are present for less than 3 months.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Percutaneous discectomy is an effective method of treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Lower success rates vs micro

No advantage of percutaneous discectomy over the open surgery was found.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Higher recurrence

There is no clinical evidence proving intradiscal electrotherapy's effectiveness or lack of thereof in radicular pain treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Either microdiscectomy, open discectomy or discectomy with the use of tubular technology are effective treatment methods of the herniated lumbar disc with radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Because of the lack of sufficient scientific evidence of proper quality, no technique can be called superior.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Because of the lack of scientific evidence of sufficient quality, the superiority of sequestrectomy over discectomy cannot be proven.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

There is no scientific evidence supporting the use of barrier methods in prevention of epidural adhesions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

The antibiotic prophylaxis applied immediately before the spine surgery decreases the risk of infectious complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

There is not enough evidence that the prophylactic administration of antibiotics after the surgery decreases the risk of infectious complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Available clinical evidence does not allow to create recommendations or contraindications for spondylodesis as a primary method of treatment of the herniated lumbar disc with radiculopathy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	No good practice

Lumbar fusion is an effective method of treatment for recurrent herniated lumbar disc, especially when the clinical presentation is dominated by axial pain and/or signs of instability.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Based on the available literature, superiority of surgical treatment over conservative treatment in herniated lumbar disc with radiculopathy cannot be proven, neither in medium nor long-term assessment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

National clinical guidelines for non-surgical treatment of patients with recent onset neck pain or cervical radiculopathy (Danish Health Authority, 2017)⁵

AGREE GRS: 5/5/5

It is good clinical practice to focus on reassuring information when counselling patients with recent onset neck pain. If using written information, this should be consistent with the oral information given in the consultation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Consider offering supervised exercise therapy to patients with recent onset neck pain in addition to other treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider offering spinal manual therapy in patients with recent onset neck pain in addition to other treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider offering exercise therapy in combination with spinal manual therapy in patients with recent onset neck pain rather than exercise therapy alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider offering spinal manual therapy in combination with exercise therapy in patients with recent onset neck pain rather than spinal manual therapy alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider offering acupuncture in patients with recent onset neck pain in addition to other treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Very low quality, individual

Only offer massage for patients with recent onset neck pain after careful consideration because no effect has been documented even with high dose treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

It is good clinical practice only to offer oral NSAID to patients with recent onset neck pain only after careful consideration. The treatment should be of short duration and carefully take into account harms, contra-indications and patient preference.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

It is good clinical practise only to offer tramadol to patients with recent onset neck pain after careful consideration. The treatment should be of short duration and carefully take into account harms, contra-indications and patient preference.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider offering exercise therapy or spinal manual therapy rather than analgesia in patients with recent onset neck pain where more than advice and information is needed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Always take into account differential diagnoses when examining or reviewing patients with low back or radicular pain, particularly if they develop new or changed symptoms. Exclude signs suggestive of possible serious underlying pathology (identified as red flags), for example, cancer, infection, trauma, inflammatory disease such as spondylarthritis, or severe neurological problems such as cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Consider using risk stratification (with for example the Subgroups for Targeted Treatment (STarT) Back risk assessment tool or the Orebro Musculoskeletal Pain Screening Questionnaire, short version) for each new episode of low back pain with or without radicular pain. This risk stratification should not be performed during the first 48h after the pain onset. The aim of the risk stratification is to inform shared decision-making about stratified management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Based on risk stratification, consider simpler and less intensive support for patients with low back pain with or without radicular pain likely to improve quickly and have a good outcome (for example, reassurance, advice to keep active and guidance on self-management)

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Based on risk stratification, consider more complex and intensive support for patients with low back pain with or without radicular pain at higher risk of a poor outcome (for example, exercise programmes with or without manual techniques and a psychological intervention such as cognitive-behavioural approach).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

In the absence of red flags, do not routinely offer imaging for people with low back pain with or without radicular pain. Only prescribe imaging if its expected result may lead to change management, e.g. when an invasive intervention is being considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Explain to people with low back pain with or without radicular pain that they may not need imaging, even if they are being referred for a specialist opinion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

Provide each patient with advice and information, tailored to their needs and capabilities, to help them self-manage their low back pain with or without radicular pain, at all steps of the treatment pathway. Include information on the benign nature of low back pain and radicular pain and encouragement to continue with normal activities, exercise included.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Consider an exercise programme (specific exercises or a combination of approaches) for people with low back pain with or without radicular pain. Take patient's specific needs, capabilities and preferences into account when choosing the type of exercise programme.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

No recommendation was formulated on postural therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

No recommendation was formulated on Alexander technique lessons.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Do not offer belts or corsets for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer foot orthotics for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer rocker sole shoes for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer traction for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Consider manipulation, mobilisation or soft-tissue techniques for managing low back pain with or without radicular pain, but only as part of a multimodal treatment with a supervised exercise programme.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

No recommendation on acupuncture has been formulated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Do not offer TENS for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Do not offer PENS for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer interferential therapy for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer ultrasound for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Consider a psychological intervention using a cognitive behavioural approach for managing low back pain with or without radicular pain, but only as part of a multimodal treatment with a supervised exercise programme.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, low quality

Consider a multidisciplinary rehabilitation programme, which combines a physical and a psychological component, incorporating a cognitive behavioural approach, and which takes into account a person's specific needs and capabilities, for people with persistent low back pain or radicular pain when they have psychosocial obstacles to recovery or when previous evidence-based management has not been effective

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Promote and facilitate return to work or normal activities of daily living as soon as possible for people with low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

If a medication is required for managing low back pain with or without radicular pain (e.g. due to severity of the pain and patients' preferences), consider oral NSAIDs taking into account potential differences between NSAIDs in gastrointestinal, liver and cardio-renal toxicity and the person's risk factors, including age.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

When prescribing oral NSAIDs for low back pain, think about appropriate clinical assessment, ongoing monitoring of the evolution of risk factors, and the use of gastro protective treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

When prescribing oral NSAIDs for low back pain, select the lowest effective dose for the shortest possible period of time.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Do not routinely offer paracetamol (as single medication) for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Think about weak opioids (with or without paracetamol) for the shortest period possible for managing acute low back pain with or without radicular pain only if an NSAID is contraindicated, not tolerated or has been ineffective.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Do not routinely offer opioids for managing chronic low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer selective serotonin reuptake inhibitors for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not routinely offer tricyclic antidepressants or non-selective serotonin-norepinephrine reuptake inhibitors for managing low back pain with or without radicular pain. This recommendation is applicable only for chronic pain; the use of antidepressants is not recommended in acute pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Low quality, individual

Do not offer anticonvulsants for managing low back pain with or without radicular pain in absence of a neuropathic pain component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer skeletal muscle relaxants for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer antibiotics for managing low back pain with or without radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer spinal injections for managing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider assessment for radiofrequency denervation for people with chronic low back pain with suspected facet joint pain when non-surgical evidence-based multimodal management has not worked for them, and the main source of pain is thought to come from structures innervated by the medial branch nerve and they have moderate or severe levels of localised back pain (rated as 5 or more on a numeric rating scale (VAS 0 10) at the time of referral.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Only do radiofrequency denervation in people with chronic low back pain after a positive response to a diagnostic medial branch block.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

Consider epidural injections of local anaesthetic and steroid in people with (sub)acute (at least 2-3 weeks) and severe radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer disc replacement in people with low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer spinal fusion for people with low back pain unless within following preconditions: after failure of a non-surgical evidence-based multimodal management and after evaluation in a multidisciplinary consultation and preferably with data registration in a register.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider spinal decompression for people with radicular pain (at least 6-12 weeks after the onset) when non-surgical evidence-based multimodal management has not improved pain or function and their radiological findings are consistent with the current clinical symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

German S2k guideline, Lumbar radiculopathy guidelines for diagnostics and therapy in neurology (German spine society, 2018)⁵

AGREE GRS: 4/5/5

Bed rest should only be prescribed during the acute phase, as long as mobilization is not possible due to pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Early mobilization and light to moderate physical activity should be encouraged.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Early and adequate analgesic therapy with NSAIDs and, if necessary, muscle relaxants should be administered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In cases of severe pain, short-term use of sustained-release opioids may be indicated.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If pain-related immobility cannot be managed in an outpatient setting, and red flag symptoms are present, acute hospital admission is required.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Early surgery is indicated in the presence of progressive paresis or bladder/bowel dysfunction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Elective surgery should be considered if conservative outpatient and/or inpatient therapy fails, provided there is a confirmed morphological cause of the pain symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In the development of chronic pain, a combination of physiotherapy and psychotherapeutic interventions (behavioural therapy, pain coping programs) is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

During the transition from acute to chronic pain, even in lumbar radiculopathy, pain-modulating medication (antidepressants) and membrane-stabilizing drugs (antiepileptics) may be used, analogous to other pain syndromes and neuralgias.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

European guidelines on perioperative venous thromboembolism prophylaxis: neurosurgery (European Society of Anaesthesiology, 2018)

AGREE GRS: 5/4/4

For patients with no additional risk factors, we suggest no active thromboprophylaxis intervention apart from early mobilisation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, imprecise

For patients undergoing spinal surgery with additional risk factors (limited mobility, active cancer, complex surgical procedure), we recommend starting mechanical thromboprophylaxis with intermittent pneumatic compression preoperatively and we suggest the addition of low-molecular weight heparin postoperatively when the risk of bleeding is presumed to be decreased.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

If low-molecular weight heparin is used, we recommend delayed initiation at least until 24h after surgery and only when haemostasis occurs.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

We suggest continued thromboprophylaxis until discharge in high-risk patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	Yes, modifications
Comments:	Very low quality, individual

In patients with spinal cord injury or significant motor impairment, we suggest extending the thromboprophylaxis into the rehabilitation phase of hospital care.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Very low quality, individual

Danish national clinical guidelines for surgical and nonsurgical treatment of patients with lumbar spinal stenosis (Danish Health Authority; Rousing *et al.*, 2019)⁵

AGREE GRS: 5/4/4

Consider offering supervised training to patients with spinal stenosis due to the general beneficial effects of training on health and the lack of known adverse effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Very low quality, individual

Spinal manual therapy should not be used routinely for patients with lumbar spinal stenosis, since the beneficial effect is uncertain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

It is good practice to avoid use of paracetamol in patients with lumbar spinal stenosis, the beneficial effect is uncertain and undocumented.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

It is good practice to avoid use of NSAIDs in patients with lumbar spinal stenosis since the beneficial effect is uncertain and there is a risk of adverse reactions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

Opioids should only be used for patients with lumbar spinal stenosis upon due consideration, since the beneficial effect is uncertain and there is a risk of adverse reactions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Very low quality, individual

It is good practice to avoid use of muscle relaxants in patients with lumbar spinal stenosis, since the beneficial effect is uncertain and there is a risk of adverse reactions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Medical treatment of neurogenic pain should only be initiated in patients with lumbar spinal stenosis upon due consideration, since the beneficial effect is uncertain and there is a risk of adverse reactions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Consider surgical decompression surgery to patients with lumbar spinal stenosis if previous nonsurgical treatment has proved inadequate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Fusion surgery should only be used as an add-on to decompression for patients with lumbar spinal stenosis upon due consideration, since the beneficial effect is uncertain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Outdated

Consider offering supervised rehabilitation to patients who have undergone surgery for lumbar spinal stenosis, due to the general beneficial effects of training and the lack of known adverse effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Guideline: Instrumented spine surgery (Dutch Orthopaedic Association, 2020)

AGREE GRS: 5/6/5

Advise patients to stop smoking prior to thoracolumbosacral spine surgery, due to its negative impact on surgical outcomes, and document this accordingly.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Advise patients on weight reduction (at least to a BMI <35 in cases of (morbid) obesity) before thoracolumbosacral spine surgery, and document this, since these patients have an increased risk of poor outcomes and complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Osteoporosis screening or treatment for osteoporosis prior to lumbar spinal fusion is not recommended in instrumented thoracolumbosacral spine surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In patients with suspected psychosocial problems or with chronic low back pain, it is recommended to use validated psychosocial questionnaires to support clinical decision-making.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Imaging with X-ray and/or MRI is recommended as a diagnostic tool in the evaluation of patients with chronic low back pain, but should not be used as a predictor of the clinical outcome of spinal fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Provocative discography has no added value in the preoperative work-up for lumbar fusion in patients with chronic low back pain, due to its low specificity. In addition, discography may potentially induce disc degeneration. The working group advises against the use of provocative discography for determining the indication for lumbar fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Facet joint blocks are not recommended as predictors of the outcome of lumbar fusion in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Thoracolumbosacral immobilization by means of a brace, with or without a pipe, is not recommended as a predictor of the outcome of lumbar fusion in patients with chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Patients with chronic low back pain (lasting longer than three months), with or without leg pain, who have not responded adequately to first-line conservative therapy, should be offered a multidisciplinary back rehabilitation program. This should consist of cognitive and functional training (teaching pain-coping strategies) under the supervision of a rehabilitation physician or clinical psychologist, combined with exercises guided by a physiotherapist.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If patients with chronic low back pain with degenerative changes at one or two lumbar levels continue to experience unacceptable symptoms after completing a multidisciplinary back/pain rehabilitation program, lumbar spinal fusion may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Decision-making regarding instrumented spinal surgery for chronic low back pain should take place within a multidisciplinary team.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended to use conventional X-ray imaging to confirm or exclude the presence of spondylolisthesis. In addition, flexion–extension views may be obtained to determine the degree of mobility. However, the extent of instability has not been shown to affect the outcome of spinal fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

An MRI scan is recommended to confirm or exclude canal and/or foraminal stenosis with possible nerve compression.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

In patients with symptomatic lumbar spondylolisthesis who do not respond adequately to conservative treatment, surgical decompression combined with instrumented spinal fusion is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	Outdated

In patients with grade 1 spondylolisthesis without mobility on dynamic (flexion–extension) X-rays, surgical treatment may consist either of decompression with fusion or of interlaminar decompression alone.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Outdated

For the diagnosis of scoliosis, a conventional standing radiograph of the entire spine in two planes, including both femoral heads, is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

MRI can demonstrate the presence of canal and/or foraminal stenosis with possible neurological compression and is recommended, particularly in patients with leg symptoms consistent with radiculopathy or neurogenic claudication.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In patients with degenerative scoliosis or sagittal plane deformity, instrumented spinal fusion should only be considered after failed conservative management and in the presence of unacceptable persistent symptoms. In cases of neurological compression, surgical stabilization should be combined with decompression surgery. Since this involves complex spinal surgery in patients who may have multiple comorbidities, patients should be thoroughly informed about the relatively high risk of complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If instrumented spinal fusion is chosen, there is no clear preference for a specific surgical technique in patients with degenerative scoliosis. The preferred technique should be determined by the patient’s individual status (flexibility of the deformity, sagittal imbalance, comorbidities) and the expertise of the treating surgeon. Given the high risk of complications, in older patients with comorbidities it may be considered to perform a more limited decompression or stabilization focused on neurological symptoms rather than a long-segment spinal fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There is no difference in effectiveness between the various spinal fusion techniques in patients with chronic low back pain. The preferred technique should be determined by the specific pathology of the individual patient and the expertise of the treating surgeon.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

It is recommended that lumbar fusion for patients with chronic low back pain preferably be performed within the context of a clinical trial. The indication for spinal fusion should be established in a multidisciplinary consultation after failure of prolonged structured conservative therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Both posterolateral lumbar fusion, PLIF, and minimally invasive TLIF contribute comparably to pain reduction after surgery. The other differences in advantages and disadvantages between these techniques are either clinically irrelevant or still unclear. Therefore, all three techniques may be used in the treatment of patients with spondylolisthesis, spondylolysis, or spondylolytic spondylolisthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Emerging evidence, individual

A disc prosthesis offers no clear advantages over spinal fusion in chronic low back pain. Given the more limited indications and the higher revision rate, the use of disc prostheses for this indication is therefore not recommended, unless within a study context with informed consent from the patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If surgical treatment of symptomatic lumbar spinal stenosis without spondylolisthesis is considered, decompression alone is preferred over the use of an interspinous process device

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

In symptomatic lumbar spinal stenosis with grade 1 spondylolisthesis, decompression with placement of an interspinous implant may be considered instead of instrumented fusion with decompression, although this is not preferred due to the high short-term revision rate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Intensive physiotherapy (in the form of exercise therapy and behavioural therapy) is recommended, as it appears to positively influence the postoperative course after instrumented lumbar spinal fusion compared with less intensive or unguided physiotherapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Exercise therapy initiated 12 weeks after instrumented lumbar spinal fusion is recommended, as it may result in more complete functional recovery than when started six weeks postoperatively. The patient, treating surgeon, and physiotherapist should jointly determine the optimal postoperative rehabilitation pathway on an individual basis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The use of a brace after instrumented posterolateral lumbar fusion for lumbar spinal fusion is not routinely recommended, as outcomes are equivalent with or without brace use.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Preferably provide patients with written, specific information about the expectations and risks of the surgery in order to improve the shared decision-making process.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Align the patient's expectations with those of the physician and document this in the informed consent. Provide information about residual symptoms, recovery period, pain, sports, and return to work/activities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Register the procedure in the national registry of instrumented spinal surgeries, using the nationally established patient-reported outcome measures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Not relevant
Comments:	National recommendation

The hospital must have at least the following: Medium Care facilities with the option for postoperative ventilation, as well as an Intensive Care Unit, or fixed agreements with a nearby external clinic/hospital to ensure 24/7 Intensive Care Unit availability. A multidisciplinary team. A local contact person/coordinator who can be easily approached for additional information. Regular peer consultations with other spinal surgeons. Participation in the national spinal surgery registry should be facilitated. Patient information brochures / website with background information, including references to professional and patient association websites. Availability of intraoperative neuromonitoring for surgical correction of degenerative scoliosis with spinal imbalance.

AIRE score:	NA
Donabedian:	Structure
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Good practice, resources

Quality requirements for spinal surgeons/spinal accreditation: Registration in the specialist register as an orthopaedic surgeon or neurosurgeon. Registration of quality of care, preferably in a national registry for instrumented spinal surgery, in accordance with current professional standards. Continuing Medical Education in line with current accreditation requirements of the professional association. Minimum annual case volume per surgeon/setting, in accordance with current accreditation requirements of the professional association, as well as regular, documented case discussions with other spinal surgeons, in line with current accreditation standards.

AIRE score:	NA
Donabedian:	Structure
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Good practice, resources

Low back pain and sciatica in over 16s: assessment and management – NICE guideline (National Institute for Health and Care Excellence, 2020)

AGREE GRS: 6/6/6

Think about alternative diagnoses when examining or reviewing people with low back pain, particularly if they develop new or changed symptoms. Exclude specific causes of low back pain, for example, cancer, infection, trauma or inflammatory disease such as spondylarthritis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Consider using risk stratification (for example, the STarT Back risk assessment tool) at first point of contact with a healthcare professional for each new episode of low back pain with or without sciatica to inform shared decision-making about stratified management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Based on risk stratification, consider simpler and less intensive support for people with low back pain with or without sciatica likely to improve quickly and have a good outcome (for example, reassurance, advice to keep active and guidance on self-management)

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Based on risk stratification, consider more complex and intensive support for people with low back pain with or without sciatica at higher risk of a poor outcome (for example, exercise programmes with or without manual therapy or using a psychological approach).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not routinely offer imaging in a non-specialist setting for people with low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Explain to people with low back pain with or without sciatica that if they are being referred for specialist opinion, they may not need imaging.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Consider imaging in specialist settings of care (for example, a musculoskeletal interface clinic or hospital) for people with low back pain with or without sciatica only if the result is likely to change management.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Good practice

Provide people with advice and information, tailored to their needs and capabilities, to help them self-manage their low back pain with or without sciatica, at all steps of the treatment pathway. Include information on the nature of low back pain and sciatica, encouragement to continue with normal activities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	Good practice

Consider a group exercise programme (biomechanical, aerobic, mind–body or a combination of approaches) within the national health service for people with a specific episode or flare-up of low back pain with or without sciatica. Take people’s specific needs, preferences and capabilities into account when choosing the type of exercise.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer belts or corsets for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer foot orthotics for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer rocker sole shoes for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer traction for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Consider manual therapy (spinal manipulation, mobilisation or soft tissue techniques such as massage) for managing low back pain with or without sciatica, but only as part of a treatment package including exercise, with or without psychological therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Do not offer acupuncture for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Do not offer ultrasound for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer PENS for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer TENS for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Do not offer interferential therapy for managing low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Consider psychological therapies using a cognitive behavioural approach for managing low back pain with or without sciatica but only as part of a treatment package including exercise, with or without manual therapy (spinal manipulation, mobilisation or soft tissue techniques such as massage).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, low quality

Consider a combined physical and psychological programme, incorporating a cognitive behavioural approach (preferably in a group context that takes into account a person's specific needs and capabilities), for people with persistent low back pain or sciatica when they have significant psychosocial obstacles to recovery (for example, avoiding normal activities based on inappropriate beliefs about their condition) or when previous treatments have not been effective.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Promote and facilitate return to work or normal activities of daily living for people with low back pain with or without sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

Do not offer gabapentin, other antiepileptics, oral corticosteroids or benzodiazepines for managing sciatica as there is no overall evidence of benefit and there is evidence of harm.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer opioids for managing chronic sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

If a person is already taking opioids, gabapentin or benzodiazepines for sciatica, explain the risks of continuing these medicines.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

As part of shared decision making about whether to stop opioids, gabapentin or benzodiazepines for sciatica, discuss the problems associated with withdrawal with the person.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Be aware of the risk of harms and limited evidence of benefit from the use of NSAIDs in sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

If prescribing NSAIDs for sciatica, take into account potential differences in gastrointestinal, liver and cardio-renal toxicity and the person's risk factors, including age. Think about appropriate clinical assessment, ongoing monitoring of risk factors and the use of gastroprotective treatment. Use the lowest effective dose for the shortest possible period of time.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Consider oral NSAIDs for managing low back pain, taking into account potential differences in gastrointestinal, liver and cardio-renal toxicity, and the person's risk factors, including age.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

When prescribing oral NSAIDs for low back pain, think about appropriate clinical assessment, ongoing monitoring of risk factors and the use of gastroprotective treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Prescribe oral NSAIDs for low back pain at the lowest effective dose for the shortest possible period of time.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Consensus, good practice

Consider weak opioids (with or without paracetamol) for managing acute low back pain only if an NSAID is contraindicated, not tolerated or has been ineffective.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer paracetamol alone for managing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not routinely offer opioids for managing acute low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer opioids for managing chronic low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Do not offer selective serotonin reuptake inhibitors, serotonin–norepinephrine reuptake inhibitors or tricyclic antidepressants for managing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer gabapentin or antiepileptics for managing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Do not offer spinal injections for managing low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual, imprecise

Consider referral for assessment for radiofrequency denervation for people with chronic low back pain when non-surgical treatment has not worked for them and the main source of pain is thought to come from structures supplied by the medial branch nerve and they have moderate or severe levels of localised back pain (rated as 5 or more on a Visual Analogue Scale, or equivalent) at the time of referral.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Only perform radiofrequency denervation in people with chronic low back pain after a positive response to a diagnostic medial branch block.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

Do not offer imaging for people with low back pain with specific facet joint pain as a prerequisite for radiofrequency denervation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

Consider epidural injections of local anaesthetic and steroid in people with acute and severe sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not use epidural injections for neurogenic claudication in people who have central spinal canal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not allow a person's body mass index, smoking status or psychological distress to influence the decision to refer them for a surgical opinion for sciatica.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Consider spinal decompression for people with sciatica when non-surgical treatment has not improved pain or function and their radiological findings are consistent with sciatic symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer spinal fusion for people with low back pain unless as part of a randomised controlled trial.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Do not offer disc replacement in people with low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

German spine society S2K guideline on conservative, surgical, and rehabilitative management of disc herniation with radicular symptoms (German spine society, 2020)⁵

AGREE GRS: 4/5/5

Pharmacotherapy should be used in patients with acute radicular symptoms to support non-pharmacological interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Pharmacotherapy should be used to support non-pharmacological interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Pharmacological pain management should be carried out for postoperative treatment of radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Pharmacotherapy should be used in patients with disc-related pain at risk of chronification to support non-pharmacological interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Acupuncture should not be used for the treatment of acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Acupuncture may be used for the treatment of a disc herniation with subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Acupuncture should not be performed for postoperative treatment of radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Acupuncture may be used for the treatment of disc-related pain at risk of chronification only in combination with exercise therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

In patients with acute disc-related radicular symptoms, the relaxation method 'progressive muscle relaxation' should not be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If psychosocial risk factors are present, cognitive behavioural therapy tailored to the individual risk profile should be offered in cases of subacute radicular pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In subacute disc-related pain, the relaxation method 'progressive muscle relaxation' may be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Psychological pain therapy should be carried out in the postoperative phase if psychosocial risk factors are present. In this case, cognitive behavioural therapy tailored to the individual risk profile should be applied.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If psychosocial risk factors are present, cognitive behavioural therapy tailored to the individual risk profile should be applied in patients with disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Information or counselling regarding a good prognosis, pain medication, the importance of promptly resuming normal daily activities for the healing process, as well as education about the safety of carrying out normal daily activities and targeted encouragement to maintain or resume normal daily activities should be part of the treatment concept.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Information or counselling on a good prognosis, pain medication, the importance of promptly resuming normal daily activities for the healing process, as well as education about the safety of performing normal daily activities and targeted encouragement to maintain or resume normal daily activities should be provided.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Information or counselling on a good prognosis, pain medication, the importance of promptly resuming normal daily activities for the healing process, as well as education on the safety of performing normal daily activities and targeted encouragement to maintain or resume normal daily activities should be given.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

To prevent chronic courses, individuals with a high risk of chronification should, after surgery, be treated in interdisciplinary rehabilitation programs with an active treatment approach.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

The use of multiprofessional health education and patient education should be carried out in patients with disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Short-term rest may be reasonable in patients with acute radicular symptoms for pain-related reasons, but long-term rest should be avoided.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Exercise therapy should not be used in the acute phase in patients with acute disc-related radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Exercise therapy should be used in the subacute phase of disc-related symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Exercise therapy may be used in the postoperative phase after disc-related procedures depending on the patient's load-bearing capacity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Sports therapy should be used in disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Physiotherapy should be used in patients with acute radicular symptoms for pain reduction and segmental unloading, rearrangement within the segment, prevention of immobilization-related muscle atrophy, stabilization of the affected motion segment, and restoration or optimization of complex movement patterns.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Physiotherapeutic methods should be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Physiotherapy should be carried out in postoperative treatment after radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Physiotherapy should be used in disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Back school should not be used in patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Mixed evidence, resources

Back school, based on a biopsychosocial approach, may be recommended in subacute or chronification-prone disc-related back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Mixed evidence, resources

In individuals with an increased risk of chronification, interventions with a combined exercise- and behaviour-based approach should be applied.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Back school treatments, based on a biopsychosocial approach and feasible in terms of load postoperatively, may be carried out in postoperative treatment after radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Mixed evidence, resources

Back school, based on a biopsychosocial approach, should be carried out in disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Mixed evidence, resources

If radicular symptoms are present, manipulations in the affected segment should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Manual therapy treatment for an accompanying blockage in adjacent spinal segments may be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In the presence of radicular symptoms with neurological deficits, manual therapeutic interventions in the affected segment should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Manual therapy treatment may be performed for an accompanying blockage in adjacent spinal segments in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Manual therapy should not be performed in the motion segment for at least 6 weeks after disc-related procedures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

In the presence of radicular symptoms with neurological deficits, manual therapeutic interventions in the affected segment should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Manual therapy treatment for an accompanying blockage in adjacent spinal segments may be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Manual therapy may be used in disc-related pain at risk of chronification only in combination with exercise therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

In the presence of radicular symptoms with neurological deficits, manual therapeutic interventions in the affected segment should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Traction should not be used in the conservative treatment of patients with acute radicular symptoms due to disc herniation for unloading of the affected motion segment and for pain relief.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	Good practice

Traction may be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Traction should not be used in the treatment of disc herniation in the postoperative stage.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Traction may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Insufficient evidence

Electrotherapy should not be used for pain relief in the conservative treatment of patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Electrotherapeutic treatment methods may be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Electrotherapy may be used after disc-related procedures, taking contraindications into account.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Electrotherapy may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Ultrasound should not be used for pain relief in patients with acute radicular symptoms in conservative treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Ultrasound may be used in the conservative treatment of subacute disc-related symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Ultrasound may be used after disc-related procedures, but not in the direct surgical area.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Ultrasound may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Massage therapy should not be used in patients with acute radicular symptoms in the acute stage, rather in areas distant from the segment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Massage may be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Massage may be used after disc-related procedures, preferably in combination with exercise therapy, but not in the direct surgical area.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Massage may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Thermotherapy may be used in patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Thermotherapy may be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Thermotherapy may be used after disc-related procedures, preferably in combination with exercise therapies; heat applications should not be applied directly to the surgical site.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Thermotherapy may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality evidence

Hydrotherapeutic or balneotherapeutic procedures may be used in patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Hydrotherapeutic or balneotherapeutic procedures may be used in subacute disc-related symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Hydrotherapeutic or balneotherapeutic procedures may be used postoperatively after wound healing.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Hydrotherapeutic or balneotherapeutic procedures may be used in disc-related pain at risk of chronification, preferably in combination with exercise therapies.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Occupational therapy functional training should not be used in patients with acute radicular symptoms. Recommendations for the use of specific exercise forms cannot be derived based on the available evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Occupational therapy functional training may be used in the subacute phase. Recommendations for the use of specific exercise forms cannot be derived based on the available evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Occupational therapy assistive device counselling and activities of daily living training may be used in the subacute phase

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Occupational therapy functional training should be used after disc-related procedures. Recommendations for the use of specific exercise forms cannot be derived based on the available evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Occupational therapy interventions such as assistive device counselling and activities of daily life training, functional and perceptual training, workplace counselling and training, and, if necessary, outreach counselling should be used in disc-related pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Orthoses may be used in individual cases in patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Orthoses may be used in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Orthoses should be used only in individual cases during rehabilitation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Orthoses should not be used in pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Interventional therapies on the spine should be used in patients with acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If an epidural injection is performed for cervical disc herniation, it should be carried out under fluoroscopic guidance and with non-crystalline corticosteroid.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, resources

Injections without a defined target, so-called 'paravertebral' injections, should not be performed in subacute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

An interventional treatment may be performed in subacute radicular symptoms of the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Interventional pain therapy may be performed for postoperative treatment of radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In postoperative radicular symptoms, transforaminal injections of the lumbar spine may be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Interventional therapy may also be performed in pain at risk of chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Percutaneous intradiscal procedures for the treatment of a disc herniation with radiculopathy should not be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

The implantation of a cervical disc prosthesis may be used in the absence of relevant segmental degeneration and in the presence of acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

The implantation of a lumbar disc prosthesis should not be used in acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

The use of an interspinous spacer should not be employed in acute radicular symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In the case of a confirmed disc herniation, with radicular symptoms, an adequate clinical finding, and consistently performed conservative therapy, and if no improvement or a worsening of the clinical symptoms occurs under conservative measures within a timeframe of 6–12 weeks, a surgical approach should be considered in order to prevent chronification of symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with radicular symptoms, given the more rapid result of surgical treatment in relation to the management of radicular pain, if there is a clear patient preference for surgery, continuation of conservative therapy may be omitted even before the expiration of the above-mentioned time frame.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In central deficits, cervical myelopathy syndrome and cauda equina syndrome caused by disc herniations in the cervical, thoracic, and lumbar spine, a general recommendation for surgical treatment should be given regardless of severity. With a low level of evidence, surgery should be performed promptly within < 48 hours.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	Good practice

Taking individual circumstances into account (best time–best team), surgery should be performed as quickly as possible in cervical myelopathy syndrome and cauda equina syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In radicular symptoms, (despite low evidence) a recommendation for early surgery should be given in cases of muscle strength ≤ 3 in functionally important muscle groups.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The Dutch multidisciplinary occupational health guideline to enhance work participation among low back pain and lumbosacral radicular syndrome patients (Dutch Organisation for Occupational Physicians, Dutch Organisation for Physicians in Social Insurance Medicine & Dutch Organisation for Medical Officers in Private Insurances, 2021)

AGREE GRS: 4/5/4

Ask the patient about current and previous care by other (para)medical professionals and its effects and consult these colleagues if their care might influence work participation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Follow the guidelines for general practitioners on low back pain and lumbar radicular pain syndrome that support interventions directed at pain and daily functioning.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No
Comments:	National

Consider assessing risk factors for low back pain and lumbar radicular pain syndrome for workers.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

If risk factors are present, consider preventive interventions and tailor-made measures to eliminate or reduce risk factors obstructing work participation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Consider assessing prognostic factors for low back pain and lumbar radicular pain syndrome for workers, consider assessing the general prognostic factors for low back pain and lumbar radicular pain syndrome or determination of a risk profile of the psychosocial factors using a prognostic tool, such as the STarT Back Screening Tool.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

If prognostic factors are present or in case of a high-risk profile on the STarT Back Screening Tool consider interventions to eliminate or reduce factors hindering work participation and to support the beneficial factors.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Inform and advise the worker and/or employer, if necessary, in consultation with other occupational health experts, about work participation despite having low back pain and lumbar radicular pain syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Advice to increase work participation according to a time contingent approach.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advice to make an action plan facilitating return to work as soon as possible in case of sick leave.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advice about return to work, defining tasks and hours.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Consider advising about additional physical, workplace-oriented or cognitive treatment in case of persistent sick leave due to low back pain and lumboradicular pain syndrome after about 6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Consider physiotherapy or exercise therapy with a time-contingent approach.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Consider high-intensity workplace-oriented physical conditioning.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Consider cognitive behavioural intervention.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Consider multi- or interdisciplinary rehabilitation, preferably vocational rehabilitation if full return to work is not completed after about 12 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advise the patient with lumboradicular pain syndrome in case of surgery about the consequences for work participation and the associated treatment process.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Inform and advise postoperatively about the expected course of recovery regarding work, stimulate activities and building up work participation, if necessary, in consultation with the general practitioner or surgeon.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advice postoperative exercise therapy, preferably high intensity training guided by a physiotherapist or exercise therapist, if work participation is insufficient after 6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Rehabilitation and lumbar surgery: the French recommendations for clinical practice (French Society of Physical Medicine and Rehabilitation, 2021)⁵

AGREE GRS: 4/5/5

Educational care (reassurance, activities of daily living, neurophysiology of pain) must be offered before lumbar surgery. This education may be combined with specific exercises (strengthening, endurance, neuromotor reprogramming, stretching) before fusion surgery and prosthesis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Regular physical activity should be offered before lumbar surgery (fusion and prosthesis), 150 min per week, prioritising independent activities personalised to the patient (Expert agreement).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The purpose of rehabilitation after lumbar surgery is to reassure the patient; improve their mobility, functional capacities and autonomy; and limit painful after-effects. It must be adapted to the physical and psychological condition of the patient, post-operative condition, professional and leisure activities (Expert agreement).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

After lumbar surgery, a suitable exercise program (adapted to age, understanding, pain, abilities and environment) and supervised, based on a booklet, an application or a website (preferably validated) should be offered to the patient. This program should be performed or continued at home.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

After lumbar surgery, patients should resume activities of daily living within the first 2 weeks postoperatively, walk immediately and gradually introduce spine movements.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

After lumbar surgery, maintaining prolonged positions for long periods and movements and postures with the trunk in extreme positions are not recommended before 6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

After lumbar discectomy, initiation of rehabilitation adapted to the patient is recommended from 3 weeks after surgery and from 4 to 6 weeks after surgery at the latest.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

After lumbar discectomy, rehabilitation offered should be adapted to the patient and of progressive intensity combined with behavioural approaches (discussion and sharing of experience between patients supervised by a professional, gradual exposure to movement, cognitive-behavioural therapies). Intense and dynamic active exercises should be proposed as a first-line choice, as opposed to isometric exercises or isolated stretching, which appear less effective.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

After lumbar discectomy, repetitive flexion exercises are not recommended before 6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	60%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

After lumbar fusion, physiotherapist-led rehabilitation may be offered before the third month. This rehabilitation can be intensified after the third month once healing is complete, with the surgeon's agreement in an environment of support to achieve patient autonomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

After lumbar fusion, behavioural approaches should be integrated into patient rehabilitation programs (discussions and sharing of experience between patients supervised by a professional, gradual exposure to movement, cognitive-behavioural therapies).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

After lumbar fusion, repeated movements and postures with the trunk held in flexion are not recommended before 6 weeks. Carrying heavy loads must be adapted before 3 months.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus statement

After lumbar disc prosthesis, rehabilitation can be offered from the sixth postoperative week. This rehabilitation can then be intensified and adapted to the patient's progress.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	66%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

After lumbar disc prosthesis, rehabilitation in forced extension and reinforcement in extension is not recommended before 6 weeks.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	64%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

After lumbar surgery, exercise methods such as strengthening paravertebral muscles (especially the extensors), aerobic training, pelvic and sub-pelvic stretching, increased mobility or neuromotor reprogramming can be implemented and adapted to the patient in the absence of contraindication.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

After lumbar surgery, the patient must continue a suitable, customised program, first supervised and then independently. In a supervised program, patients can be given a sequence of exercises, advice for the gradual resumption of activities of daily living, support for the resumption of physical activities and sports, carried out in the presence of a physiotherapist in an institution or by a community physiotherapist during regular consultations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Educational interventions (structured information, discussion forum, therapeutic education, active educational interventions, ‘back-café’) are an integral part of the care process and involve sharing of knowledge and/or experience (with other patients, an expert patient and/or a health or adapted physical activity professional) after lumbar surgery, regardless of the method used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Educational content for rehabilitation before or after lumbar surgery must be based on dedicated materials for low back pain (Back guide, before/after back surgery information booklet) with science- and/or practice-validated messages combined with information about the surgery (preparation, expectations of surgery, post-operative consequences).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Consensus, individual

After lumbar surgery, information diffusion by brochure or video alone is insufficient for patients with risk factors for chronicity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

After lumbar surgery, wearing a corset or belt is only recommended on a case-by-case basis, based on the patient's pain and exposure to mechanical stresses, and should be for the minimum duration possible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Surgical treatment of degenerative lumbar stenosis and spondylolisthesis: Clinical practice guideline (Czech Republic, 2023)⁵

AGREE GRS: 5/5/5

Open surgical decompression in patients with degenerative lumbar stenosis may be recommended for patients with significant physical limitations correlating with imaging findings and failure of prior conservative treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Fusion (spondylodesis) has a negligible role in the case of simple degenerative lumbar stenosis and should only be used as an adjunct to decompression in selected patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Following surgery for degenerative lumbar stenosis, while RCTs showed no significant difference between supervised rehabilitation and home/no exercise, supervised post-surgical physical activity is suggested due to exercise benefits and lack of known adverse effects.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

For stable degenerative spondylolisthesis, both decompression alone and decompression with fusion yield comparable outcomes. Considering benefits, risks, and costs, simple decompression is preferred. No recommendation is made for unstable spondylolisthesis due to insufficient evidence.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Assess the following prognostic factors for persistent low back pain and lumbosacral radicular syndrome: Previous episodes of low back pain and lumbosacral radicular syndrome, a high degree of limitations in activities, pain in the leg, high intensity of pain, bad general health status or quality of life, psychological and psychosocial stress, pain-related fear of movement, feelings/symptoms of depression, passive coping style, negative expectations about recovery or catastrophizing, high degree of physical load at work, bad relationships with colleagues and diminished job satisfaction. Consider using measurement instruments when analysing prognostic factors. There are no strict cut-off values available for most measurement instruments, and use of strict cut-off values is also not recommended

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

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. Then select among the following profiles: Low risk of persistent symptoms, moderate risk of persistent low back pain and high risk of persistent low back pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

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. Consider using the STarT Back Screening Tool to support the evaluation of the risk of persistent complaints. Never base the evaluation solely on this tool.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Give patients with low back pain in the treatment profiles 1, 2 and 3 information and advice: Integrate information and advice as a part of the therapy for all patients with low back pain. The information and advice takes place during the preliminary stage, treatment and follow-up care. Provide the patient with clear, consistent and personalized information and communicate with empathy in clear, comprehensible language. Avoid language that encourages fear of pain and catastrophic thinking (e.g. terms like: injury, degeneration or wear and tear). Use the term 'low back pain' and avoid the term 'non-specific'. 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 catastrophizing.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Information and advice for patients with low back pain: Explain that it is often unclear how low back pain exactly arises and that there is often a combination of factors present. Explain that low back pain occurs often and frequently returns, and that the severity and duration of the low back pain can differ each time. Explain that after three months about half of the patients are pain-free and physical functioning has been recovered. Explain that recovery can be expedited by remaining active and limiting bed rest, self-management for recovery, active coping strategies, positive emotions and a healthy lifestyle. Explain that the presence of negative prognostic factors can cause the recovery to progress less rapidly. Explain that the vast majority of people with low back pain have no indications for an underlying rare condition. 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. 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. 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. 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.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Information and advice for patients with lumbosacral radicular syndrome: Explain that lumbosacral radicular syndrome is characterized 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. Explain that lumbosacral radicular syndrome significantly recovers in most patients in the first three months, without requiring surgical intervention. 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 a MRI is indicated if there are signs of a rare cause of the back complaints, or if the symptoms of lumbosacral radicular syndrome are so debilitating and/or long-lasting that surgery or another specialized therapy is considered. Explain that proving a hernia nuclei pulposi by means of a MRI has no added value in conservative treatment. Explain that, in case of a lumbosacral radicular syndrome, 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. Keep in mind that increased pain should be prevented in the presence of high irritability. High irritability is defined as: a lumbar flexion range of motion (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 irritability 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 to the physician / general practitioner will be provided so that the treatment options can be discussed: continued conservative treatment or a secondary care referral to carry out further examination.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Advise the patient with lumbosacral radicular syndrome 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.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Exercise therapy for patients with low back pain: Profile 1 - Consider giving instructions for exercise therapy to be done independently. Profile 2 and - Offer exercise therapy. Type of exercise therapy: Focus the exercise therapy on the patient's needs, preferences and capabilities as determined during the medical history taking and the physical examination. Encourage the patient to resume or expand activities, preferably gradually and in a time contingent manner. 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. If permissible, scale back the guidance during the treatment period and 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

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Exercise therapy for patients with lumbosacral radicular syndrome: Profile 1,2,3 - 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. Type of exercise therapy: Focus on pain alleviation in the presence of high irritability. In the presence of moderate irritability, increased pain of short duration (a part of a day) is acceptable. Increase the exercise therapy depending on the pain. 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.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, resources

Behaviour-oriented treatments: Profiles 1 and 2 - A thorough explanation and focus on the biopsychosocial model are sufficient. Profile 3 - Consider behaviour-oriented treatment in patients with dominant (psychosocial) prognostic factors. Consider personalizing the behaviour-oriented treatment by aiming this specifically at the psychosocial prognostic factors. Focus behaviour-oriented treatment on encouraging movement behaviour with or despite pain. 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 authorized.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Mobilizations and manipulations: Profile 1 - Do not perform mobilizations or manipulations. Profile 2 and 3 - Consider performing mobilizations and/or manipulations 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 mobilizations 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 or motor deficit. Discuss the choice of mobilization 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

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

AO Spine guideline for the use of osteobiologics (AOGO) in anterior cervical discectomy and fusion for spinal degenerative cases (AO Spine, 2024)

AGREE GRS: 6/6/6

In primary ACDF surgery for degenerative conditions, we suggest that either structural iliac crest autograft or a cage with an osteobiologic (such as tricalcium phosphate, demineralised bone matrix, hydroxyapatite or allograft) can be used with similar outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

In primary ACDF surgery for degenerative conditions, we suggest either allograft or a cage with an osteobiologic depending on factors such as availability, costs and resources.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

When using a cage with osteobiologic in ACDF surgery, we suggest osteobiologics other than bone morphogenetic protein in common clinical situations.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

We suggest that an osteobiologic can be used in single- or multi-level primary ACDF surgery for degenerative conditions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Resources

In ACDF–total disc replacement hybrid construct surgery for degenerative conditions, we suggest for the fusion level using either structural iliac crest autograft or allograft or a cage with osteobiologic (such as demineralised bone matrix, bovine bone or bone morphogenetic protein-2) to achieve similar outcomes.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

German Spine Society S2k guideline, specific low back pain (German Spine Society; Kroppenstedt, 2024)⁵

AGREE GRS: 4/5/5

Diagnostic facet blocks (medial branch block under fluoroscopy) should be considered in patients with suspected facet syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Radiofrequency denervation of the facet joints may be considered in patients with persistent facet joint pain after a positive diagnostic test.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

If the symptoms are refractory to conservative or interventional therapy, the indication for surgery may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In suspected discogenic lumbar syndrome, MRI should be performed if imaging is required; primary CT is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

To confirm a discogenic lumbar syndrome, lumbar discography should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If symptoms are refractory to conservative therapy, the indication for surgery may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Intradiscal procedures should not be applied.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with chronic back pain beginning before the age of 45, the symptom 'inflammatory back pain' should be assessed in the history. Testing for HLA-B27 should be considered in these patients.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Patients with chronic back pain beginning before the age of 45 and with the symptom 'inflammatory back pain' or a positive HLA-B27 test should be referred to rheumatology with suspicion of axial spondyloarthritis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Non-operative symptomatic pharmacological and physical-therapeutic measures, as well as injection of local anaesthetics with corticosteroids, are recommended for Bastrup's disease.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Due to the variety of clinical symptoms and differential diagnoses, MRI and, if necessary, standing radiographs should be performed in suspected spinal claudication. If instability is suspected, functional radiographs should be obtained.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Despite the relatively limited evidence of long-term success for pharmacological therapy, physiotherapy, orthoses, and injections, a trial of conservative treatment with outcome monitoring should initially be attempted if there is no neurological deficit or immobilizing pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Surgical decompression should be considered in the presence of additional spinal claudication symptoms when conservative measures are insufficient to achieve a satisfactory quality of life for the individual patient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In surgical treatment of lumbar spinal canal stenosis, routine use of fusion techniques in addition to decompression should not be performed. If clinical and radiological signs of instability are present, additional stabilization should be undertaken. A variety of surgical techniques may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

The use of interspinous spacers for surgical treatment of conservatively therapy-refractory lumbar spinal canal stenosis should not be performed routinely.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

Postoperative physiotherapy improves the patient's functional status as well as leg and back pain, and should therefore be pursued. No recommendations can be made regarding specific physiotherapeutic techniques.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

As the basis of radiological diagnostics, standing lumbar spine radiographs in two planes and functional views should be obtained.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

A standing lateral full-spine radiograph may provide important additional information for assessing sagittal balance parameters, particularly in planning surgical interventions.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Individual, resources

MRI should be performed in cases of spondylolisthesis with neurological findings and for surgical planning.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In high-grade spondylolisthesis and spondyloptosis, CT imaging should be obtained for surgical planning.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Symptomatic spondylolysis or isthmic spondylolisthesis should initially be treated conservatively, provided there are no acute neurological deficits.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If symptoms do not improve with conservative measures, surgical treatment may be appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Symptomatic degenerative spondylolisthesis without functionally relevant acute paresis of the associated nerve roots should initially be treated conservatively.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

If conservative measures are insufficient to achieve a satisfactory quality of life for the individual patient, surgical measures may be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Surgical treatment of degenerative spondylolisthesis should generally include decompression, with or without additional segmental stabilization.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Individual, imprecise

At the initial presentation, patients should be informed about the benign nature of the condition, its favourable spontaneous course, and advised on behavioural measures.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In cases of corresponding hypomobile reversible dysfunction, manual medical or therapeutic procedures should be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Infiltrations may be considered in patients with a persistent sacroiliac joint syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

Percutaneous neurotomy may be considered in patients with a persistent sacroiliac joint syndrome.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence

In recurrent and in acute exacerbations of chronic low back pain, the pain-inducing individual findings as well as basic functional disorders may be treated to prevent further chronification.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For sustainable treatment results and relapse prevention, training of intermuscular coordination with proprioceptive training, including integration of segmental stabilization may be useful within the therapy program.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

Hypomobile segmental dysfunction of the lumbar spine (blockage) as a specific cause of low back pain should be treated with methods of manual medicine (manipulation, mobilization, soft tissue techniques).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

German Spine Society S3 guideline, epidural injections in degenerative spinal disorders (German Spine Society, 2025)⁵

AGREE GRS: 4/5/5

In a transforaminal injection, the contrast agent or medication should reach the preganglionic epidural space.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In an interlaminar injection, the medication should reach the ventral epidural space.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A transforaminal diagnostic injection can be performed to identify a painful nerve root.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

A diagnostic transforaminal injection should be carried out exclusively with a small amount of local anaesthetic (0.2–0.3 ml).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Transforaminal therapeutic injections under fluoroscopy may be considered for radicular symptoms originating from the cervical spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

Transforaminal therapeutic injections under fluoroscopy should be offered in cases of radicular pain caused by lumbar disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Interlaminar injections under fluoroscopy may be considered for radicular symptoms originating from the cervical spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Interlaminar injections may be considered for radicular symptoms originating from the lumbar spine.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

Interlaminar injections should not be performed in cases of back pain without a morphological correlate or without a radicular component.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Interlaminar injections of the lumbar spine should be performed with imaging guidance when technically feasible.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A caudal injection may be considered in cases of lumbo-ischialgia.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Moderate quality, individual

A caudal injection should be performed with imaging guidance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

Epidural injection may be performed in acute, subacute and chronic pain. An individual decision for each patient regarding the timing of an epidural injection is necessary.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In patients with chronic pain, pharmacological therapy as well as physiotherapy should have been carried out before epidural injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

In patients with chronic pain, epidural injection should be embedded in an interdisciplinary overall treatment concept based on the biopsychosocial model.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The gold standard for transforaminal and interlaminar injections is fluoroscopy. Transforaminal injections and interlaminar injections of the cervical and lumbar spine should be performed under fluoroscopy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

CT or ultrasound may be used for transforaminal and interlaminar injections.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

When CT is used as the imaging method, CT fluoroscopy may be performed without a planning scan.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

Caudal epidural injections should be performed under fluoroscopy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

Ultrasound may be used for caudal injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

Sedation, with the patient remaining responsive, may be carried out during an epidural injection under appropriate monitoring.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes
Comments:	Limited, individual, imprecise

When planning the access route for a transforaminal injection of the lumbar spine, in addition to the classical sub-pedicular (supra-neural) approach, the infra-neural approach should also be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, individual

For interlaminar access in the cervical or lumbar spine, a parasagittal approach should be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

To assess needle depth and spread of contrast agent during an interlaminar injection under fluoroscopy, a contralateral oblique view should be employed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A cervical interlaminar injection should be performed at the level C7/T1, or not cranial to C6/7.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

A mixture of ropivacaine with dexamethasone should not be used for epidural injection, since crystal formation may occur, which can lead to embolism in the event of intra-arterial injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

No recommendation can be made as to whether corticosteroid improves efficacy in epidural injection and in which dosage it should be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

For transforaminal injection of the cervical spine, only non-crystalline corticosteroids (e.g., dexamethasone) should be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

For transforaminal injection of the lumbar spine, a non-crystalline corticosteroid (e.g., dexamethasone) should be the first choice.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

Corticosteroid preparations without preservatives (such as benzyl alcohol) should be preferred for epidural application.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

At the time of publication of the guideline, corticosteroid preparations are not approved for epidural use (interlaminar, transforaminal, peri-radicular). Their use is therefore off-label.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, geographical

Interlaminar injections carry a non-negligible risk of epidural hematoma.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

For each patient undergoing epidural injection, an individual risk-benefit assessment should be performed regarding continuation or discontinuation of anticoagulants or antiplatelet agents.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Complications after epidural interventions are overall very rare, but very severe complications have been reported in case reports in the literature.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Existing imaging (particularly MRI) should be evaluated prior to epidural injection with regard to anatomical peculiarities (e.g. course of the vertebral artery).

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

After an intervention, the patient should undergo neurological examination and monitoring to detect early complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Patient feedback (in person, in writing, or by telephone) should be obtained within the first 14 days after the intervention to detect late complications.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, resources

In radicular symptoms originating from the cervical spine, both a transforaminal and an interlaminar approach may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In radicular symptoms originating from the lumbar spine, a transforaminal approach may be preferred over an interlaminar approach.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Repetition of the same epidural injection should only be performed after a previously positive response (e.g. reduction of VAS by at least 2 points) with insufficient duration of effect or recurrent symptoms, at an interval of at least 1–3 weeks from the previous injection.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Repetition of the same injection without any effect from the previous injection, or serial injections without evaluation of effect between injections, should not be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

The total number of injections should be limited, taking into account the maximum dose of 200 mg (3 mg/kg body weight) methylprednisolone equivalent per year.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

An epidural injection may be performed in both an outpatient setting and during an inpatient stay.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Asia and
Oceania

Clinical guideline for treatment of symptomatic thoracic spinal stenosis (Spinal Surgery Group of the Chinese Orthopaedic Association, 2015)⁵

AGREE GRS: 3/5/4

MRI is helpful for determining the radiological type of ossified ligamentum flavum or ossified posterior longitudinal ligament (solitary, continuous or saltatory type), the encroaching ratio in each segment, the degree of compression of the spinal cord and signals within the spinal cord.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

In patients with solitary thoracic ossified ligamentum flavum or ossified posterior longitudinal ligament or disc herniation, a CT scan of the involved segment is recommended, whereas in those with the continuous or saltatory type of ossified ligamentum flavum or ossified posterior longitudinal ligament, a CT scan of the whole thoracic spine, including an axial scan and sagittal reconstruction, is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Cervical or lumbar spinal plain films, including anteroposterior and lateral views, should be performed in patients with upper or lower thoracic spinal stenosis to assist in identifying any transitional vertebrae and confirming the precise level intraoperatively.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

In patients whose clinical features do not conform with the radiological findings or those suspected of having motor neuron diseases, an electromyogram should be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

In patients with chest or abdominal wall radiculopathy or mild myelopathy, short-term conservative treatment is acceptable provided close follow-up is provided. Appropriate forms of conservative treatment include medication (NSAIDs, neurotrophic medicines) and physical therapy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Patients with serious symptoms of thoracic myelopathy should be treated surgically as soon as the diagnosis has been established.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Patients with mild symptoms of thoracic myelopathy can be treated conservatively with close follow-up. If progressive deterioration in symptoms occurs, surgery should promptly be undertaken.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Continuous intra-operative monitoring of both MEP and SSEP is recommended to facilitate timely recognition of intra-operative spinal cord injury.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, resources

Thoracic spinal stenosis secondary to ossified ligamentum flavum: posterior en bloc or segmental laminectomy or floating decompression is recommended. A high speed drill should be used.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Internal fixation and fusion can be performed in patients with thoracolumbar regional stenosis and those who have undergone multiple segmental laminectomy.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Thoracic spinal stenosis secondary to disc related factors (hard disc herniation, posterior vertebral hyperplasia, posterior marginal cartilaginous node): both anterolateral approach and posterior transforaminal approach discectomy and fusion can be appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Thoracic spinal stenosis secondary to ossified posterior longitudinal ligament: the procedure should be chosen according to the location and form of the area of ossification and the degree of compression of the spinal cord. For solitary ossified posterior longitudinal ligament in the middle or lower thoracic spine, both anterolateral and posterior transforaminal resection of the ossified posterior longitudinal ligament with fixation and fusion is appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

For short regional ossified posterior longitudinal ligament (two to three segments), a posterior approach circumferential decompression and fusion is appropriate; sometimes posterior laminectomy alone can achieve sufficient decompression of the spinal cord.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

The optimal operative procedure for long regional ossified posterior longitudinal ligament (more than three segments) depends on the form of ossified posterior longitudinal ligament. When the area of ossification is flat, posterior laminectomy with decompression of one more segment cranially and caudally is recommended, whereas when it is raised, posterior laminectomy and selective circumferential decompression is recommended. Primary posterior laminectomy and secondary anterolateral resection of the ossified posterior longitudinal ligament and fusion is also appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	69%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Thoracic spinal stenosis secondary to ossified ligamentum flavum combined with ossified posterior longitudinal ligament or hard disc herniation: the surgical procedure should be selected according to the specific characteristics of the condition: If anterior compression is mild, posterior laminectomy is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Good practice

If posterior compression is mild, both anterolateral decompression with fusion and posterior transforaminal circumferential decompression with fusion are appropriate.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If both anterior and the posterior compression are severe, posterior circumferential decompression on combined posterior and anterior approaches can be performed.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	70%
Use in the appropriate context:	Yes
Comments:	None

Thoracic spinal stenosis combined with cervical spondylotic myelopathy: the clinical symptoms, signs and radiological findings must be comprehensively assessed, the symptoms being the major guide. And it is recommended to decide and treat the primary responsible lesion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

If the symptoms are mild in the upper limbs and severe in the lower limbs, prior thoracic decompression is recommended, especially when the signals within the cervical spinal cord are normal on MRI.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

If the symptoms are severe in all four limbs, or the cervical spinal cord is markedly compressed with abnormal inner signals on MRI, prior cervical decompression surgery is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Thoracic decompression may be needed if the symptoms in the lower limbs have not improved significantly by 3 months follow-up.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	63%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, individual

In patients with upper thoracic ossified ligamentum flavum combined with cervical multi-segmental ossified posterior longitudinal ligament, one- or two-stage posterior cervical laminoplasty and posterior thoracic laminectomy is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Thoracic spinal stenosis combined with lumbar spinal stenosis or lumbar disc herniation: the clinical symptoms should be considered the major guide to identifying the primary responsible lesion and selecting a treatment approach. When both pathologies are relatively severe, the principle is to decompress the thoracic spinal cord first.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	67%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Changes in spinal cord function should be assessed by calculating Japanese Orthopaedic Association (JOA) thoracic spinal cord or Chinese Orthopaedic Association thoracic spinal cord scores.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Changes in pain should be assessed with VAS scores

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	83%
Use in the appropriate context:	Yes
Comments:	None

Changes in social and psychological state should be assessed with the Short Form Health Survey-36

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Changes in coexisting cervical or lumbar disorders should be assessed by calculating the JOA cervical spinal cord scores and the Oswestry disability index.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Non-invasive MRI is optimal for the diagnostic imaging of lumbar spinal stenosis. However, various imaging findings, including those of MRI, do not necessarily mean that the patient is symptomatic. Therefore, symptomatology should be given top priority in the diagnosis of lumbar spinal stenosis, and it is necessary to fully recognize that various tests are no more than auxiliary diagnostic modalities.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

The Zurich Claudication Questionnaire is useful as a disease-specific questionnaire for lumbar spinal stenosis for which surgical treatment is selected. In addition, the JOA back pain Evaluation Questionnaire, Oswestry Disability Index and Roland–Morris Disability Questionnaire are used as questionnaires for individuals with low back pain.

AIRE score:	NA
Donabedian:	Outcome
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

There is strong evidence of the usefulness of limaprost in patients with the cauda equina type or combined type, and the balance between benefits and harms is secured and recommended, but evidence of its efficacy against the nerve root type and pain is considered insufficient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	57%
Use in the appropriate context:	No
Comments:	Insufficient evidence

It is suggested to use NSAIDs in the short term for lumbar spinal stenosis with nerve root type and low back pain. On the other hand, they have limited usefulness against the cauda equina type, and their administration is not recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

There was no consistency in the evidence related to the efficacy of gabapentin, and the incidence of adverse events was higher than that for placebo or other drugs; thus, evidence about its usefulness is considered insufficient.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Exercise therapy under the guidance of specialists is more effective in alleviating pain and improving physical functions, activities of daily living and quality of life than self-training.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

The optimal type of exercise therapy has not been clarified.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	60%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Exercise therapy is less effective than decompression, but it is associated with a lower risk of adverse events and is more cost-effective, so it can be recommended except in severe cases.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	78%
Use in the appropriate context:	Yes
Comments:	None

Corsets may be useful for alleviating pain and extending walking distance.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Short term benefit, individual

TENS may be useful for treating postoperative residual symptoms.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	65%
Use in the appropriate context:	Yes, modifications
Comments:	Limited, short term, imprecise

The usefulness of walking sticks, therapeutic ultrasound and hyperthermia remains to be determined, and there are no reports of the usefulness of traction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Nerve block injection is useful for the short-term alleviation of pain and improvement of quality of life, and it is suggested to perform it.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

The combination of steroids in nerve block injection further alleviates pain and improves quality of life in the short term, but the effects disappear in the medium and long term. On the other hand, due to concerns about the side effect of adrenal suppression, it is suggested to maintain a short combination period.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

There is insufficient evidence to recommend spinal manipulation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

As no studies have directly compared pharmacotherapy and other conservative treatments with cases involving the natural course, there is no answer for the answer if pharmacotherapy and other conservative treatments for lumbar spinal stenosis lead to better outcomes than the natural course.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

There is insufficient evidence regarding the long-term outcomes of pharmacotherapy and other conservative treatments.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	75%
Use in the appropriate context:	Yes
Comments:	None

Surgery for lumbar spinal stenosis is broadly divided into procedures performed with decompression only and procedures with fusion. Decompression surgery includes direct decompression, which is performed by resecting bone and ligament tissues anatomically surrounding and compressing neural tissues, and indirect decompression, which alleviates compression on neural tissues by applying traction to soft tissues surrounding the nerves without resecting the tissues. In terms of fusion, rigid fusions that fuse the vertebrae with pedicle screws are commonly performed, but stabilization that preserves intervertebral flexibility is also performed, considering the decreased range of motion and long-term effects on adjacent levels. From the aspects of the surgical technique, implants, and indications, there are several minimally invasive procedures in the surgeries for lumbar spinal stenosis. Surgical procedures should be selected with patient consent based on comprehensive evaluations including not only short-term, but also long-term clinical outcomes, risk of complications, and cost-effectiveness.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	84%
Use in the appropriate context:	Yes
Comments:	None

Several reports have indicated that decompression for lumbar spinal stenosis produces better clinical outcomes than conservative treatment, and it is suggested to perform decompression for patients with lumbar spinal stenosis without instability definitely diagnosed by physical findings and imaging, in whom conservative treatment is ineffective.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	85%
Use in the appropriate context:	Yes
Comments:	None

Conservative treatment is recommended as initial treatment, but for patients with severe symptoms, from the viewpoint of medical cost, aimless continuation of conservative treatment should be avoided

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

While decompression with fusion is useful for patients with spinal instability and the improvement of quality of life/activities of daily life is expected, the cost is higher than that of decompression alone and the return-to-work rate is slightly poorer. The rates of complications and reoperation are also higher than those of decompression alone, so it is necessary to examine indications by fully considering pathological conditions and surgical procedures, such as instability and the need for long-segment fusion.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	82%
Use in the appropriate context:	Yes
Comments:	None

Fusion is more useful than decompression alone for patients with low back pain accompanied by instability (slippage and rotation) or obesity.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Limited evidence, imprecise

The bone union state may affect clinical outcomes, but currently, a clear recommendation cannot be presented.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

A clear recommendation cannot be made as to whether surgical treatment using interspinous process devices is more useful than conservative treatment for lumbar spinal stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	55%
Use in the appropriate context:	No recommendation
Comments:	Insufficient evidence

Compared with decompression alone, surgery using interspinous process devices does not show significant differences in the improvement of clinical symptoms, but the reoperation rate is higher, and it is less cost-effective, so it is suggested not to perform it.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	80%
Use in the appropriate context:	Yes
Comments:	None

There is no high-quality study comparing the vertebral arch spacer with fusion, so its usefulness is hardly clear, and a clear recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	41%
Use in the appropriate context:	No
Comments:	Insufficient evidence

There is only one RCT on dynamic stabilization using pedicle screws, but its quality is not so high and the usefulness is unclear. Thus, a clear recommendation cannot be made.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	52%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For patients with lumbar spinal stenosis, minimally invasive spine surgery may be more useful for preventing the occurrence of iatrogenic instability, alleviating low back pain and reducing the bleeding volume than conventional surgery, and it is suggested to perform it.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	76%
Use in the appropriate context:	Yes
Comments:	None

Even in the very elderly aged ≥ 80 years (octogenarian and over), surgical treatment for lumbar spinal stenosis results in the improvement of clinical symptoms and is useful. Thus, it is suggested to perform it.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Postoperative physiotherapy can be recommended as it is useful for alleviating pain and improving activities of daily life/quality of life 3 months after surgery, but it lacks usefulness 1 year after surgery.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	74%
Use in the appropriate context:	Yes
Comments:	None

Korean medicine clinical practice guidelines for lumbar herniated intervertebral disc in adults: based on grading of recommendations assessment, development and evaluation (Korean Acupuncture and Moxibustion Medicine Society, Society of Korean Medicine Rehabilitation, Association of the Spine and Joint Korean Medicine, 2022)

AGREE GRS: 4/2/2

Acupuncture is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Acupuncture in combination with conventional treatment is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

The addition of thermal stimulation or electrical stimulation during acupuncture is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Deep-insertion acupuncture should be considered for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	59%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Moxibustion is recommended for improving pain with lumbar herniated intervertebral disc based on the consensus of the expert group

AIRE score:	NA
Donabedian:	Process
AGREE REX:	54%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Moxibustion treatment causing deqi sensation may be considered for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	54%
Use in the appropriate context:	No
Comments:	Low quality evidence

Herbal medicine should be considered to improve the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient, imprecise

Herbal medicine in combination with conventional treatment is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient, imprecise

The combination of pharmacopuncture with conventional treatment should be considered for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Tuina manual therapy is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

A combination of Tuina manual therapy and conventional treatment is recommended for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Thread-embedding acupuncture should be considered to improve the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Thread-embedding acupuncture in combination with conventional treatment should be considered for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

Cupping treatment should be considered in combination with conventional treatment for improving the overall symptoms of lumbar herniated intervertebral disc.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	53%
Use in the appropriate context:	No
Comments:	Very low quality, individual

Guidelines for the diagnosis and treatment of lumbar spinal stenosis with integrated traditional Chinese medicine and Western medicine (Chinese Association of Integrative Medicine, Chinese Society of Traditional Chinese Medicine, Chinese Medical Association, 2024)⁵

AGREE GRS: 3/2/2

For lumbar spinal stenosis with wind-cold obstruction pattern, use the classic formula of Juanbi Decoction on a syndrome-differentiation basis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For lumbar spinal stenosis with qi deficiency and blood stasis pattern, use the classic formula Buyang Huanwu Decoction on a syndrome-differentiation basis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For lumbar spinal stenosis with liver–kidney deficiency pattern, use the classic formula Duhuo Jisheng Decoction.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For lumbar spinal stenosis with qi deficiency and blood stasis or liver–kidney deficiency patterns, Danlu Tongdu tablets are recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For lumbar spinal stenosis with low-back and leg pain, acupuncture can improve pain and activities of daily living.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

For lumbar spinal stenosis caused by ligamentum flavum hypertrophy, lateral recess stenosis, etc., needle-knife (acupotomy) can improve pain and lumbar function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For lumbar spinal stenosis with local soft-tissue spasm and facet joint dysfunction, tuina/manual therapy can reduce pain and improve lumbar function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Low quality, individual

After surgery for lumbar spinal stenosis, Buyang Huanwu Decoction is recommended to improve postoperative pain and lumbar function.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	Insufficient evidence

For moderate–severe symptomatic lumbar spinal stenosis, perform decompression; if symptoms are mainly radicular and there is no instability, decompression alone is suggested; in patients ≥ 75 years, decompression may be considered.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	62%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

When neurological function deteriorates rapidly, open decompression with or without fusion is recommended.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	61%
Use in the appropriate context:	Yes, modifications
Comments:	Individual, imprecise

Percutaneous image-guided lumbar decompression is recommended; it reduces pain, improves function, and quality of life.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	51%
Use in the appropriate context:	No
Comments:	Insufficient evidence

Interspinous process distraction device implantation is a minimally invasive option that enlarges the nerve root canal and can be used for neurogenic claudication due to lumbar nerve stenosis.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	44%
Use in the appropriate context:	No
Comments:	No durable data

Evidence-based clinical practice guidelines for patients with lumbar disc herniation with radiculopathy in South Korea (Korean Pain Society, Korean Spinal Pain Society, Korean Spinal Neurosurgery Society, 2025)

AGREE GRS: 4/5/5

Surgical treatment may be performed to relieve pain and improve functional outcomes in patients with low back or radicular pain due to lumbar disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	None

Endoscopic surgery can be considered for patients with lumbar disc herniation presenting with radicular leg pain.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Epidural nerve blocks are recommended for pain relief and functional improvement in patients with low back or radicular pain due to lumbar disc herniation.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	68%
Use in the appropriate context:	Yes, modifications
Comments:	Individual assessment

Core muscle stabilization and strengthening exercises are recommended for patients with lumbar disc herniation undergoing conservative treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

Core muscle stabilization and strengthening exercises are recommended for patients with lumbar disc herniation who have undergone surgical treatment.

AIRE score:	NA
Donabedian:	Process
AGREE REX:	72%
Use in the appropriate context:	Yes
Comments:	Good practice

¹ International, national and society-endorsed guidelines on degenerative spinal surgery, along with their recommendations, were included. Non-guideline consensus statements, position papers, policy statements, surveys and systematic reviews were excluded. When multiple versions of the same guideline existed, only the most recent version was considered. ² The guidelines were assessed using the AGREE GRS instrument (Appendix 9). This validated tool, derived from the more comprehensive AGREE II instrument, provides a concise and pragmatic approach to evaluating and quantifying the quality of clinical practice guidelines. The first score reflects the overall quality of the guideline, the second assesses its applicability for use in practice and the third captures whether a guideline of this quality should be incorporated into professional decision-making. The items were scored on the Likert scale, where a score of 1 signifies that the item is not met or that relevant information is lacking, whereas a score of 7 indicates that the item is clearly met. ³ The quality indicators were evaluated using the AIRE instrument, a validated tool for evaluating and quantifying the methodological quality of healthcare quality indicators (Appendix 8). However, no quality indicators could be retrieved. ⁴ The guideline recommendations were assessed using the AGREE REX instrument (Appendix 10). This tool complements the AGREE GRS instrument by specifically evaluating the quality and implementability of guideline recommendations. ⁵ Translated from the original language to English with the help of DeepL translator (<https://www.deepl.com/en/translator>).