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# Quality of clinical practice guidelines on interventional management of low back pain: A systematic review

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## Abstract

**Objective:** To appraise the quality of low back pain (LBP) clinical practice guidelines (CPG) that include interventional management recommendations and to associate their quality with characteristics including publication year and creating organization.

**Type:** Systematic Review.

**Literature Survey:** LBP (subacute or chronic) CPGs in English (symptom based, governmental or professional society created, January 1990-May 2020) were found using MEDLINE, EMBASE, CINAHL, Ortho Guidelines, CPG Infobase, ECRI, Guidelines International Network, NICE, and SIGN.

**Methodology:** In this third order systematic review, search results were deduplicated, title and abstract screened by two independent reviewers, and full texts reviewed by four reviewers. Discrepancies were resolved by a third reviewer. Resulted CPGs were appraised using the Appraisal of Guidelines for Research and Evaluation (AGREE II) Tool by four appraisers each. Association of their quality with creating organization, geographical region, and year of creation was calculated.

**Synthesis:** Seven hundred fourteen screened documents resulted in 21 final CPGs. On appraisal, average overall CPG quality was 5.2 (range 2.5-6.75). Domain 5 (applicability) had the lowest average (44%) and domain 4 (clarity of presentation) had the highest average score (82%). For overall recommendation, 16 received “yes” or “yes with modifications,” six received unanimous “yes” and two unanimous “no” votes. The interrater agreement of domain scoring was excellent (0.8-1.0;  $p < .001$ ). There was no association found between quality of CPG and (1) year of publication ( $R^2 = 0.0006$ ), (2) whether the CPG was updated or new ( $p = .17$ ), and (3) region of publication ( $p = .37$ ).

**Conclusions:** The majority of the 21 CPGs identified in this systematic review were of high quality, but overall quality and recommendation ratings were variable. The quality of appraised CPGs showed no association with their characteristics. Some domains such as “applicability” scored uniformly lower, revealing opportunity for improvement in future CPG development. LBP CPGs should be scrutinized before adopting their recommendations.

## INTRODUCTION

Chronic low back pain (LBP)—and its associated syndromes—is a highly prevalent (84% lifetime incidence) medical condition that also poses a high societal burden.<sup>1</sup> In 2010, LBP ranked first among

medical conditions contributing to disability in the United States.<sup>2</sup> In 2011, the Institute of Medicine (IOM) estimated LBP’s financial impact on the U.S. health care system to be from \$560 to \$630 billion USD per year,<sup>3</sup> with indirect costs estimated at six times the direct cost.<sup>4</sup>

There is high variability in the medical care given to patients with LBP, particularly in interventional pain management.<sup>3</sup> The top 10% of providers who perform interventions performed nine times more procedures per patient when compared with the bottom 10% and 4.5 times more procedures than the median provider.<sup>5</sup> Over the last few decades, there has been an increase in interventional management of LBP. Between 2000 and 2011, all interventional techniques (except for implantables, continuous epidurals, intra-articular injections, trigger point and ligament injections, peripheral nerve blocks, and vertebroplasty procedures) increased 228%.<sup>3</sup>

It is therefore important to review the available evidence to determine if the current practices are in line with evidence-based recommendations. However, it is impractical to expect clinicians to keep abreast of the vast amount of literature related to the diagnosis and treatment of LBP.<sup>6</sup> Clinical practice guidelines (CPGs) are an evidence-synthesis tool that facilitates translation of research into clinical practice. CPGs provide a set of evidence-based clinical recommendations on a specific clinical condition or circumstance intended to improve quality of care and decrease variability in practices and health care costs. CPGs are defined by the IOM as “statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefit and harms of alternative care options.”<sup>7</sup> Although there are many LBP CPGs, their quality and clinical relevance are highly debated.

CPGs are important to the optimal medical treatment of LBP, but because of a number of barriers, are inconsistently implemented in clinical practice. These barriers include lack of understanding of the CPG, compatibility concerns between current practices and CPG, lack of CPG relevance to practice, and possibly low level of practitioner agreement with the CPG.<sup>8</sup> Additional barriers include lack of comprehension of the CPG development process, including how they can be applied to practice. CPGs in and of themselves can also have disagreeing or conflicting evidence.

In addition to implementation problems, the value and impact of CPGs themselves remains variable.<sup>3</sup> CPG development is not a standardized process, and therefore in some situations the validity of recommendations is called into question. Barriers to proper development of CPGs can include bias from conflicts of interest, inappropriate and poor methodological quality, poor writing and ambiguous presentation, recommendations that are too restrictive with elimination of clinician autonomy, and overzealous and inappropriate recommendations (either positive, negative, or noncommittal).<sup>3</sup>

The Appraisal of Guidelines for Research & Evaluation II (AGREE II) tool provides a systematic way of appraising the variability in CPG development and quality. The tool is used to assess the quality of CPGs and

give a numbered score so that a CPG's quality can be compared with another's and the evidence and recommendations from the best quality CPGs can be adopted.

Recent AGREE II appraisals of LBP CPGs that have been published include Hoydonckx et al., 2019<sup>9</sup> and Castellini et al., 2020.<sup>10</sup> However, there have been a few new CPGs from a variety of organizations and with different focuses that have been published since Hoydonckx's study. Castellini et al.'s study included only CPGs from January 2016 to January 2020 and focused on rehabilitation, pharmacological, and surgical treatments as a whole.

The aim of this study, was to assess the quality of currently available CPGs on subacute and chronic LBP using the AGREE II instrument and to evaluate associations between certain characteristics of CPGs (eg, publishing organization, region of development, and year of creation) and their quality. CPGs that addressed interventional management of subacute and chronic LBP were the focus of our review because of the issues discussed earlier in this section and practical considerations of the study investigators. As a result, we did not review CPGs that exclusively addressed management of acute LBP because we felt they would fall outside the scope of our review. [Correction added on 04 August 2022, after first online publication: in this version, edits have been made in the above paragraph that do not affect the meaning of the content.]

## METHODS

### Overview

First, we searched for all appropriate and relevant published guidelines. Next, any articles and guidelines that did not meet criteria were eliminated. Once we identified the final group of CPGs, we appraised their quality using the AGREE II tool.

This study was registered with PROSPERO, the international prospective register of systematic reviews (registration number: CRD42020185582), and followed the guidelines set forth by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Figure 1).<sup>11</sup>

### Search strategy

A comprehensive literature search was conducted by two medical librarians between May 14–27, 2020 using the following bibliographic databases from inception: Ovid MEDLINE (In-Process & Other Non-Indexed Citations and Ovid MEDLINE 1946 to Present), Ovid EMBASE (1974 to present), and CINAHL with Full Text (EBSCO). No article type, date, or language restrictions

were included in the search. The full Ovid MEDLINE search strategy is available in Figure 2. Team members also searched the following guideline databases: The American Academy of Orthopedics Ortho Guidelines, CPG Infobase, ECRI, Guidelines International Network, NICE Evidence Search, and the Scottish Intercollegiate Guideline Network.

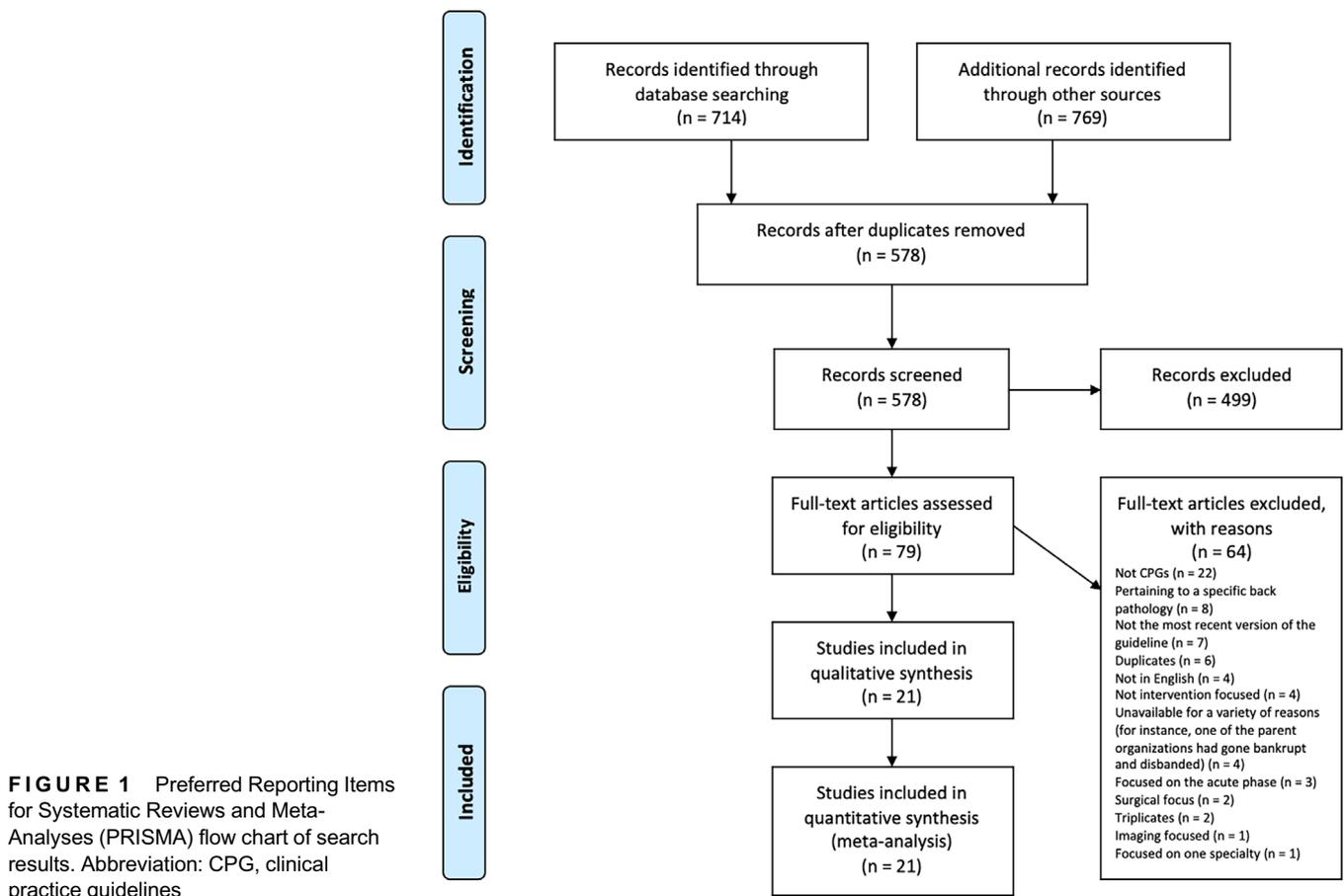
## Study selection

The results produced from the database searches were imported into EndNote, a citation management tool, and deduplicated. The deduplicated citations were screened by title and abstract against predetermined inclusion and exclusion criteria by two independent reviewers, with discrepancies resolved by a third reviewer. Then, full texts were reviewed by four reviewers in two groups of two with discrepancies resolved by a third reviewer.

To be eligible, articles had to meet the following inclusion criteria:

1. Published international and national clinical practice guidelines or practice guidelines (referred to as “guidelines” or “CPGs” from here on) pertaining to the evaluation and management of LBP

2. Explicit identification of the document as a “guideline”
3. Published as full text between January 1990 and May 2020
4. Guidelines published by professional societies, academies, public organizations or similar government or nongovernmental health care policy groups.
5. LBP guidelines that include recommendations pertaining to injections/interventions/procedures (referred to as “injections” from here on)
6. Guidelines that define LBP based on symptoms, or as a clinical syndrome, without specific imaging-based diagnostic criteria
7. Guidelines that include LBP and related clinical syndromes (radiculopathy etc.), provided the LBP only recommendations are separately stated from other related clinical syndromes. [only relevant information pertaining to recommendations for LBP will be extracted]
8. Most recent complete guideline, including any revisions made on that guideline thereafter
9. Time frame of LBP, if specified, must include sub-acute (~6-12 weeks) or chronic (>12 weeks)
10. Guidelines pertaining to LBP in specified populations, such as pediatric, geriatric, or adult populations



**FIGURE 1** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart of search results. Abbreviation: CPG, clinical practice guidelines

Ovid MEDLINE search strategy:

1. low back pain/ or ((low\* adj3 back adj3 pain\*) or (low\* adj3 back adj3 ache\*) or (low\* adj3 backache\*) or (loin adj3 pain\*) or lumbago or (lumbal adj3 pain\*) or (lumbal adj3 syndrome\*) or lumbalgia or lumbalgia or (lumbar adj3 pain\*) or (lumbar adj3 spine adj3 syndrome\*) or lumbodynia or (lumbrosacral adj3 pain\*) or (lumbrosacral adj3 syndrome\*) or (lumbrosacroiliac adj3 strain\*)).mp.
2. Injections, Spinal/ or ((spinal adj3 injection\*) or (intraspinal adj3 injection\*) or (intrathecal adj3 injection\*) or (spinal adj3 infusion\*) or (spinal adj3 administration) or (intraspinal adj3 administration) or (intra-spinal adj3 administration)).mp.
3. Injections, Epidural/ or ((epidural adj3 administration) or (epidural adj3 application\*) or (epidural adj3 dose\*) or (epidural adj3 infiltration\*) or (epidural adj3 infusion\*) or (epidural adj3 injection\*) or (epidural adj3 medication\*) or (epidural adj3 treatment\*) or (extradural adj3 administration) or (extradural adj3 infusion\*) or (extradural adj3 injection\*) or (peridural adj3 administration) or (peridural adj3 injection\*)).mp.
4. radiofrequency ablation/ or catheter ablation/ or ((radiofrequency adj3 ablation) or (radio adj3 frequency adj3 ablation) or (radio-frequency adj3 ablation) or RFA).mp.
5. nerve block/ or ((autonomic adj3 block\*) or (nerve adj3 block\*) or (conduction adj3 block\*) or (neurogenic adj3 block\*) or (medial adj3 branch adj3 block\*)).mp.
6. Injections, Intra-Articular/
7. Injections, Intra-Articular/ or ((intraarticular adj3 administration) or (intraarticular adj3 delivery) or (intraarticular adj3 injection\*) or (intraarticular adj3 infusion\*) or (intraarticular adj3 medication\*) or (intraarticular adj3 treatment) or (intra-articular adj3 administration) or (intra-articular adj3 delivery) or (intra-articular adj3 injection\*) or (intra-articular adj3 infusion\*) or (intra-articular adj3 medication\*) or (intra-articular adj3 treatment\*) or (intracoxal adj3 administration) or (joint adj3 infusion\*) or (joint adj3 injection\*) or (intrasynovial adj3 administration) or (intrasynovial adj3 injection\*)).mp.
8. exp rhizotomy/ or rhizotom\*.mp.
9. Glucocorticoids/ or (glucocorticoid\* or glycocorticoid\*).mp.
10. Steroids/ or (steroid\* or cyclosteroid\*).mp.
11. spine/ or (spine or spinal or vertebra\* or (columna adj3 dorsalis) or (dorsal adj3 column)).mp.
12. zygapophyseal joint/ or (zygapophyseal or zygapophysial or zygapophysis or facet\*).mp.
13. sacroiliac joint/ or (sacroiliac\* or ileosacral or iliosacral or transforamin\*).mp.
14. Injections/ or (injection\* or injectable\* or shot\* or intervention\* or procedur\*).mp.
15. 11 or 12 or 13
16. 14 and 15
17. Guideline/ or Guidelines as Topic/ or Practice Guideline/ or guideline\*.mp.
18. 1 and 16 and 17

Exclusion criteria included:

1. Documents that are not guidelines (reviews, opinions, original research etc.)
2. Guidelines under development
3. Complete guidelines with older publications dates superseded by more recent complete guidelines
4. Guidelines on LBP with no recommendations pertaining to injections
5. Guidelines focusing only on surgical treatment of LBP
6. Guidelines focusing only on diagnostic or radiologic/imaging aspects of LBP
7. Guidelines only pertaining to the acute time frame of LBP management
8. Guidelines on LBP that have specific imaging-based diagnostic criteria [spondylolisthesis, compression fractures, etc.]
9. Guidelines that do not clearly define LBP as a symptom-based diagnosis
10. Guidelines published by insurance companies or industry
11. Guidelines specific to one institution or one specialty [spine surgery, chiropractors etc.]
12. Clinical practice standards, defined as consensus statements or opinions, reached by non-evidence-based means
13. Guidelines published in a language other than English

CPGs that addressed acute LBP were included if they also addressed subacute and chronic LBP. In total, after a full-text review, 21 articles reporting findings and recommendations of CPGs, met the study criteria. See “CPG Search and Selection” in the Results section, including Figure 1 the PRISMA flow diagram outlining the study selection process, for more information.

### Quality assessment of guidelines

The quality of the CPGs was assessed using the AGREE II tool (Figure 3). It comprises 23 items across six domains. The six domains include scope

**FIGURE 2** Search strategy. Search strategy used in this systematic review

and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence. Each item was judged on a 7-point Likert scale ranging from 1, corresponding to strongly disagree, to 7, corresponding to strongly agree. Each of the 21 CPGs was assessed by four appraisers. There were six appraisers in total, each appraiser evaluating 14 CPGs. The appraisers assessed each CPG by rating 23 items (7-point scale) and providing a summative overall quality rating (7-point scale), and CPG recommendation (recommend, not recommend, or recommend with modifications).

## Interrater reliability

Interrater reliability was assessed by calculating intraclass correlation coefficients (ICCs). ICCs were calculated using the scores given by all four raters for all 21 CPGs. The ICC calculations included ICC for all items of all domains of all CPGs, ICCs for each domain (1–6) for all CPGs, and ICC for all CPG final scores. The ICCs were computed using analysis of variance (ANOVA) modeling calculated via SPSS Statistics

(from IBM). The higher the ICC calculation, the more reliable the ratings.

## CPG characteristic association with quality

CPGs were also divided into groups based on characteristic (year of publication, updated vs. new, region of publication) for analysis of association between these characteristics and the quality of CPGs in each group. The association between year of publication and quality of CPG was examined using linear regression analysis. The association between quality of CPG and whether a CPG was an update or new was examined using a *t*-test. For region of publication (United States, United Kingdom, Europe, other) and quality of CPG, the association was analyzed using an ANOVA test.

## RESULTS

### CPG search and selection

The initial search yielded 714 documents. Five hundred seventy eight remained after deduplication. Four

Item	Content	Domain
1	The overall objective(s) of the guideline is (are) specifically described.	Scope and Purpose
2	The health question(s) covered by the guideline is (are) specifically described.	
3	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	
4	The guideline development group includes individuals from all relevant professional groups.	Stakeholder Involvement
5	The views and preferences of the target population (patients, public, etc.) have been sought.	
6	The target users of the guideline are clearly defined.	
7	Systematic methods were used to search for evidence.	Rigour of Development
8	The criteria for selecting the evidence are clearly described.	
9	The strengths and limitations of the body of evidence are clearly described.	
10	The methods for formulating the recommendations are clearly described.	
11	The health benefits, side effects, and risks have been considered in formulating the recommendations.	
12	There is an explicit link between the recommendations and the supporting evidence.	
13	The guideline has been externally reviewed by experts prior to its publication.	Clarity of Presentation
14	A procedure for updating the guideline is provided.	
15	The recommendations are specific and unambiguous.	
16	The different options for management of the condition or health issue are clearly presented.	
17	Key recommendations are easily identifiable.	Applicability
18	The guideline describes facilitators and barriers to its application.	
19	The guideline provides advice and/or tools on how the recommendations can be put into practice.	
20	The potential resource implications of applying the recommendations have been considered.	
21	The guideline presents monitoring and/or auditing criteria.	Editorial Independence
22	The views of the funding body have not influenced the content of the guideline.	
23	Competing interests of guideline development group members have been recorded and addressed.	

**FIGURE 3** The appraisal of guidelines for research & evaluation II (AGREE II) tool.<sup>33</sup>

[Correction added on 04 August 2022, after first online publication: Figure 3 has been replaced in this version and citation 33 added.]

<sup>a</sup>: Extracted from the AGREE II instrument

<https://doi.org/10.1371/journal.pone.0174831.t001>

**TABLE 1** Characteristics of appraised clinical practice guidelines

Number	CPG	Developer (location)	Original or adaptation, edition	Focus/scope	Search source
1	An Update of Comprehensive Evidence-Based Guidelines for Interventional Techniques in Chronic Spinal Pain. Part I: Introduction and General Considerations PLUS Part II: Guidance and Recommendations	ASIPP (United States)	Original, fifth	Interventional techniques for chronic spinal pain persisting beyond 6 months	MEDLINE
2	Low back pain and sciatica in over 16s: assessment and management	National Institute for Health and Care Excellence (United Kingdom)	Original, second	Low back pain and sciatica in people aged 16 and over. Physical, psychological, pharmacological, and surgical treatments	NICE
3	National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy	Danish Health Authority (Denmark)	Original, first	Nonsurgical interventions for recent onset (<12 weeks). Nonspecific back pain and lumbar radiculopathy	Hand search
4	Low back pain: early management of persistent non-specific low back pain	NCCPC (United Kingdom)	Original, first	Physical, psychological, pharmacological, and invasive procedures for chronic nonspecific low back pain lasting longer than 6 weeks but less than 12 months	Hand search
5	Health Care Guideline: Adult Acute and Subacute Low Back Pain. Sixteenth Edition	ICSI (United States)	Original, 16th	Treatment algorithm for adults age 18 and over who have acute or subacute (<12 weeks) symptoms of low back pain or radiculopathy.	ECRI
6	Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care: Diagnosis and Treatment of Low Back Pain	NASS (United States)	Original, first	Diagnosis guidelines. Medical + psychological, PM&R-specific, interventional, and surgical treatments for nonspecific low back pain that does not radiate lower than the knee in individuals 18 and older	Hand search
7	Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group	ASRA (United States)	Original, first	Radiofrequency ablation, nerve blocks, and intra-articular injections for lumbar facet pain	MEDLINE
8	Chapter 4 European guidelines for the management of chronic nonspecific low back pain	COST B13 Working Group on Guidelines for Chronic Low Back Pain (European Union)	Original, third	Diagnosis, physical treatments, psychological interventions, pharmacology, and invasive procedures for chronic nonspecific pain	Hand search
9	Evidence-Informed Primary Care Management of Low Back Pain	Toward Optimized Practice (Canada)	Original, third	Comprehensive review of interventions for nonspecific low back pain	Canadian CPG InfoBase

(Continues)

TABLE 1 (Continued)

Number	CPG	Developer (location)	Original or adaptation, edition	Focus/scope	Search source
10	Comprehensive Evidence-Based Guidelines for Facet Joint Interventions in the Management of Chronic Spinal Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	ASIPP (United States)	Original, first	Primarily invasive interventions for facet joint pain/chronic spinal pain	Hand search
11	Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain	American Pain Society (United States)	Original, first	Primarily invasive options for chronic nonradicular and radicular back pain	MEDLINE
12	Low Back Pain and Radicular Pain: Assessment and Management	KCE (Belgium)	Original, first	Interventions (covers pharmacology, noninvasive, and invasive options) for chronic low back pain without serious underlying cause and radicular pain in individuals 18 years and older	Guidelines International Network
13	Nonsurgical treatments for patients with radicular pain from lumbosacral disc herniation	The Spine Journal (South Korea)	Original, first	Nonsurgical interventions for patients 18 and older presenting with low back and radicular leg pain and diagnosed with lumbosacral disc herniation	MEDLINE
14	Responsible, Safe, and Effective Use of Biologics in the Management of Low Back Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	ASIPP (United States)	Original, first	Regenerative medicine techniques in treatment of low back and extremity pain	Hand search
15	VA/DoD Clinical Practice Guideline for Diagnosis and Treatment of Low Back Pain	The Diagnosis and Treatment of Low Back Pain Work Group (United States)	Original, second	Diagnosis and nonsurgical treatments for adults with low back pain	ECRI
16	Dutch Multidisciplinary Guideline for Invasive Treatment of Pain Syndromes of the Lumbosacral Spine	Dutch Multidisciplinary Panel (Netherlands)	Original, first	Invasive treatment (e.g., injections and surgeries) of degenerative uncomplicated spinal low back pain syndromes.	MEDLINE
17	Evidence-Based Clinical Practice Guidelines for Management of Persistent Non-Specific Low Back Pain	Clinical Practice Guidelines Subcommittee (Saudi Arabia)	Adaptation, first	Clinical assessment, pharmacological and non-pharmacological treatments, and referrals to surgery for persistent non-specific back pain	Guidelines International Network
18	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	Collaboration between physicians across the United States (United States)	Original, second	Detailed exploration into different injection therapies for chronic, degenerative low back pain	MEDLINE

(Continues)

TABLE 1 (Continued)

Number	CPG	Developer (location)	Original or adaptation, edition	Focus/scope	Search source
19	Low back and radicular pain: a pathway for care developed by the British Pain Society	British Pain Society (United Kingdom)	Original, first	Pathway to primary care management of low back pain, including diagnosis, treatment, and referrals.	MEDLINE
20	The management of acute/subacute soft tissue injuries to the low back: evidence update and recommendations for clinical practice	University of Adelaide and WorkCover SA (Australia)	Original, first	Diagnosis, prognosis, treatment, and prevention of acute/subacute (<3 months) soft tissue injuries to the low back. Target population is employees older than 16 years of age who had sustained acute/subacute low back soft tissue injury.	Guidelines International Network
21	Chronic nonspecific (musculoskeletal) low back pain. Guidelines of the Russian Society for the Study of Pain (RSSP)	RSSP (Russia)	Original, first	Primarily diagnostic and nonsurgical treatment options for chronic nonspecific musculoskeletal low back pain	Forward citations

Abbreviations: ASIPP, American Society of Interventional Pain Physicians; ASRA, American Society of Regional Anesthesia & Pain Medicine; CPG, clinical practice guideline; DoD, Department of Defense; ECRI, Emergency Care Research Institute; ICSI, Institute for Clinical Systems Improvement; KCE, Belgian Health Care Knowledge Centre; MEDLINE, Medical Literature Analysis and Retrieval System Online; NASS, North American Spine Society; NCCPC, National Collaborating Centre for Primary Care; NICE, National Institute of Health and Care Excellence; RSSP, Russian Society for the Study of Pain; VA, Veterans Affairs.

hundred ninety-nine were then screened out based on criteria. Seventy-nine articles were selected for full-text review. The full-text reviews were conducted in two groups of two, each evaluating half of the full texts, with discrepancies resolved by a third reviewer. Of the 79 full texts, 64 were excluded (see specific exclusion reasons in Figure 1). This resulted in an initial selection of 26 full texts for CPG appraisal, but after additional review, a final total of 15 texts were identified for the next step.

Handsearching and forward citations were gathered and deduplicated, producing 769 additional citations for screening. Those citations went through an identical process to the initial search. The forward citations yielded one additional CPG, and the handsearching yielded an additional five CPGs.

In total, after a full-text review, 21 articles met the study criteria. See Figure 2 the PRISMA flow diagram outlining the study selection process.

### CPG characteristics

The 21 CPGs included 5 from hand searches, 7 from MEDLINE, 1 from NICE, 1 from forward citations, 2 from ECRI, 1 from Canadian CPG InfoBase, 1 from CINAHL, and 3 from Guidelines International Network. These CPGs were developed in countries all around

the world, including the United States ( $n = 9$ ), the United Kingdom ( $n = 3$ ), Denmark ( $n = 1$ ), Russia ( $n = 1$ ), South Korea ( $n = 1$ ), Australia ( $n = 1$ ), Canada ( $n = 1$ ), Belgium ( $n = 1$ ), Saudi Arabia ( $n = 1$ ), the Netherlands ( $n = 1$ ), and the European Union ( $n = 1$ ). Seven of the CPGs were updated, and 14 were new. Of the updated CPGs, three were second edition, two were third edition, one was fifth edition, and one was 16th edition. Only one of the CPGs was an adaptation (Evidence-Based Clinical Practice Guidelines for Management of Persistent Non-Specific Low Back Pain); the rest were original. Refer to Table 1 for more information on the respective 21 CPGs.<sup>6,12-31</sup>

### AGREE II domain, overall quality, and recommendation scores

The average overall quality scores of the CPGs calculated using the AGREE II tool ranged from 2.5 (21: Chronic nonspecific [musculoskeletal] low back pain. Guidelines of the Russian Society for the Study of Pain [RSSP]) to 6.75 (2: Low back pain and sciatica in over 16s: assessment and management [NICE], and 6: Evidence-Based Clinical Guidelines for Multi-disciplinary Spine Care: Diagnosis and Treatment of Low Back Pain [NASS]). Six CPGs had an average overall quality score above 6 (CPGs #1, 2, 5, 6, 12, 15),

**TABLE 2** Average domain scores and net averages of appraised clinical practice guidelines. [Correction added on 04 August 2022, after first online publication: the header of column one has been updated in this version and a new column “CPG” has been added. Footnotes have been added to Table 2 as well.]

Number	CPG	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Average
1	An Update of Comprehensive Evidence-Based Guidelines for Interventional Techniques in Chronic Spinal Pain. Part I: Introduction and General Considerations PLUS Part II: Guidance and Recommendations	90%	64%	86%	82%	29%	96%	75%
2	Low back pain and sciatica in over 16s: assessment and management	93%	82%	88%	90%	72%	69%	82%
3	National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy	88%	54%	70%	82%	22%	77%	66%
4	Low back pain: early management of persistent non-specific low back pain	93%	75%	77%	90%	40%	71%	74%
5	Health Care Guideline: Adult Acute and Subacute Low Back Pain. Sixteenth Edition	92%	61%	80%	90%	65%	90%	80%
6	Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care: Diagnosis and Treatment of Low Back Pain	94%	85%	94%	97%	30%	77%	80%
7	Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group	69%	44%	64%	83%	27%	58%	58%
8	Chapter 4 European guidelines for the management of chronic nonspecific low back pain	78%	75%	69%	89%	36%	29%	63%
9	Evidence-Informed Primary Care Management of Low Back Pain	82%	57%	63%	90%	52%	27%	62%
10	Comprehensive Evidence-Based Guidelines for Facet Joint Interventions in the Management of Chronic Spinal Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	86%	58%	86%	86%	38%	90%	74%
11	Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain	85%	69%	86%	88%	50%	94%	79%
12	Low Back Pain and Radicular Pain: Assessment and Management	86%	81%	95%	96%	82%	94%	89%
13	Nonsurgical treatments for patients with radicular pain from lumbosacral disc herniation	89%	43%	59%	83%	18%	48%	57%
14	Responsible, Safe, and Effective Use of Biologics in the Management of Low Back Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	65%	44%	80%	74%	45%	90%	66%
15	VA/DoD Clinical Practice Guideline for Diagnosis and Treatment of Low Back Pain	93%	90%	82%	93%	65%	69%	82%
16	Dutch Multidisciplinary Guideline for Invasive Treatment of Pain Syndromes of the Lumbosacral Spine	75%	63%	61%	72%	36%	58%	61%
17	Evidence-Based Clinical Practice Guidelines for Management of Persistent Non-Specific Low Back Pain	86%	63%	62%	81%	66%	60%	70%
18	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	58%	32%	47%	60%	15%	75%	48%
19	Low back and radicular pain: a pathway for care developed by the British Pain Society	68%	68%	35%	50%	55%	65%	57%

(Continues)

TABLE 2 (Continued)

Number	CPG	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Average
20	The management of acute/ subacute soft tissue injuries to the low back: evidence update and recommendations for clinical practice	90%	69%	75%	83%	65%	40%	70%
21	Chronic nonspecific (musculoskeletal) low back pain. Guidelines of the Russian Society for the Study of Pain (RSSP)	32%	21%	18%	57%	14%	48%	32%
Average		81%	62%	70%	82%	44%	68%	68%

Domains of the AGREE II tool: Domain 1: scope and purpose, domain 2: stakeholder development, domain 3: rigor of development, domain 4: clarity of presentation, domain 5: applicability, domain 6: editorial independence.

Percentages signify what proportion of possible points a CPG was awarded in each domain of the AGREE II tool (100% would signify that a CPG scored a perfect score in that domain).

eight CPGs had a score between 5 and 6 (CPGs #4, 7, 8, 9, 10, 11, 14, 20), four CPGs had a score between 4 and 5 (3, 13, 16, 17), two had a score between 3 and 4 (CPGs #18, 19), and only one had a score less than 3 (CPG #21). See Table 2 for more details on the average overall scoring of each CPG.

Domain 5 (applicability) had the lowest average percent score at 44%, and domain 4 (clarity of presentation) had the highest overall average percent score at 82%. All domains except for domain 5 had an average percent score of at least 60%.

Table 3 reports the overall recommendation results. Sixteen CPGs received only “yes” or “yes with modification” recommendations. Five CPGs received at least 1 vote for “no” recommendation (CPGs #16, 17, 18, 19, 21). Six CPGs only received “yes” votes (CPGs #1, 2, 6, 8, 11, 12). Only two CPGs received only “no” votes (CPGs #19, 21).

The CPGs examined in this study were dated from 2009 to 2020. We found no association between year of CPG creation and quality, with the  $R^2 = 0.0006$ . [Correction added on 04 August 2022, after first online publication: Figure 4 and its callout have been removed from this version.]

We similarly analyzed the association between whether a CPG was an update or new and the overall quality score using a *t*-test. There were 7 updated CPGs out of the 21 total and ranged from second update to 16th update. *T*-test revealed no statistically significant differences ( $p = .17$ ) between the quality of updated CPGs and new CPGs.

Analysis of association between region of publication and overall quality score of CPGs revealed: Regions (mean overall quality scores): United States (5.56), United Kingdom (5.42), Europe (5.19), and non-US/UK/Europe (4.45). An ANOVA test revealed no statistically significant differences between the mean quality scores of CPGs from these regions ( $p = .37$ ).

### Interrater reliability

Table 4 reports the interrater reliability results (calculations were conducted for each domain separately,

with all 21 CPGs included in the calculation). Random ICC calculations ranged from .792 (for domain 4, clarity of presentation, and for domain 6, editorial independence) to .960 (for domain 3, rigor of development). All *p* values were  $<.001$ . Overall, these calculations revealed that the ratings given by each evaluator for each domain was reliable across all CPGs.

### DISCUSSION

The quality (lowest possible score = 1; highest possible score = 7) of appraised CPGs spanned from an average overall quality score of 2.5<sup>29</sup> to 6.75.<sup>18,27</sup> The average overall quality score for all 21 CPGs was 5.20 with 14 out of 21 CPGs with an overall quality score  $\geq 5$ . Most of the CPGs appraised were of moderate to high quality. In addition, given 16 of the 21 CPGs received “yes” only or “yes with modification” recommendations (13 with  $\geq 50\%$  “yes” recommendation), and only 5 of the 21 CPGs received  $\geq 1$  vote for “no” recommendation, there is further support that the majority of the appraised CPGs are of high quality. This review provides an appraisal of the quality of available LBP CPGs, which can inform future development of higher quality CPGs. Recommendations made in higher quality CPGs can be more reliably used to guide clinical practice.<sup>10</sup> [Correction added on 04 August 2022, after first online publication: in this version, edits have been made in the above paragraph that do not affect the meaning of the content.]

This appraisal shared many similarities and differences with other similar appraisals.<sup>9,10</sup> The average domain scores in this study ranged from 44% (domain 5) to 82% (domain 4), whereas Castellini et al.’s study<sup>10</sup> ranged from 11% (domain 5) to 67% (domain 6) and in Hoydonckx et al.’s appraisal<sup>9</sup> ranged from 43.7% (domain 5) to 94.4% (domain 1). The average overall quality score was 68% in this study versus 42%<sup>10</sup> and 67.5%<sup>9</sup> in the comparison studies. The largest difference in domain score was 32% for domain 4 between our appraisal and Castellini et al. and in domain 6 (15.2%) between our appraisal and

**TABLE 3** Overall quality scores and recommendation ratings of appraised clinical practice guidelines. [Correction added on 04 August 2022, after first online publication: the header of column one has been updated in this version and a new column “CPG” has been added. Footnotes have been added to Table 3 as well.]

Number	CPG	Average overall quality score	Yes	Yes, with modifications	No
1	An Update of Comprehensive Evidence-Based Guidelines for Interventional Techniques in Chronic Spinal Pain. Part I: Introduction and General Considerations PLUS Part II: Guidance and Recommendations	6	100%	0%	0%
2	Low back pain and sciatica in over 16s: assessment and management	6.75	100%	0%	0%
3	National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy	4.75	50%	50%	0%
4	Low back pain: early management of persistent non-specific low back pain	5.75	75%	25%	0%
5	Health Care Guideline: Adult Acute and Subacute Low Back Pain. Sixteenth Edition	6	50%	50%	0%
6	Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care: Diagnosis and Treatment of Low Back Pain	6.75	100%	0%	0%
7	Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group	5	25%	75%	0%
8	Chapter 4 European guidelines for the management of chronic nonspecific low back pain	5.25	100%	0%	0%
9	Evidence-Informed Primary Care Management of Low Back Pain	5	50%	50%	0%
10	Comprehensive Evidence-Based Guidelines for Facet Joint Interventions in the Management of Chronic Spinal Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	5.5	75%	25%	0%
11	Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain	5.75	100%	0%	0%
12	Low Back Pain and Radicular Pain: Assessment and Management	6.5	100%	0%	0%
13	Nonsurgical treatments for patients with radicular pain from lumbosacral disc herniation	4.5	25%	75%	0%
14	Responsible, Safe, and Effective Use of Biologics in the Management of Low Back Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines	5.25	25%	75%	0%
15	VA/DoD Clinical Practice Guideline for Diagnosis and Treatment of Low Back Pain	6.25	75%	25%	0%
16	Dutch Multidisciplinary Guideline for Invasive Treatment of Pain Syndromes of the Lumbosacral Spine	4.25	0%	50%	50%
17	Evidence-Based Clinical Practice Guidelines for Management of Persistent Non-Specific Low Back Pain	4.5	25%	0%	75%
18	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	3.5	0%	25%	75%
19	Low back and radicular pain: a pathway for care developed by the British Pain Society	3.75	0%	0%	100%
20	The management of acute/ subacute soft tissue injuries to the low back: evidence update and recommendations for clinical practice	5.75	50%	50%	0%
21	Chronic nonspecific (musculoskeletal) low back pain. Guidelines of the Russian Society for the Study of Pain (RSSP)	2.5	0%	0%	100%

Quality score is the grade of overall quality in the AGREE II tool. Graded using a 7 point Likert scale (with 1 being the lowest possible quality and 7 being the highest possible quality).

“yes” vs “yes with modification” vs “no” is in response to the question “I would recommend this guideline for use” as part of the AGREE II tool.

The % indicates what % of reviewers gave each CPG each recommendation grade as part of the AGREE II tool.

Hoydonckx et al. Domain 5 (applicability) had the lowest average domain score in all three studies, which is not uncommon for rehabilitation CPGs.<sup>32</sup> Improving the quality of information in the applicability and implementability domains in future LBP CPGs is recommended so that clinicians and practices can better use such CPGs to more make evidence-informed changes to their clinical practices.

Our appraisal differed from these studies for a number of reasons. First, the Castellini et al. appraisal focused on a variety of therapies (surgery, rehabilitation, pharmacologic), whereas our appraisal focused only on CPGs that included interventional treatments. Second, the four appraisers in Castellini et al. went through two “calibration rounds” on a sample of four unrelated CPGs, whereas the appraisers in our study completed the recommended training on the AGREE II website. Therefore, differences in familiarity with the AGREE II tool could have contributed to the differences noted in the quality scores between our studies. Although there were some common CPGs that overlapped in both appraisals,<sup>4,16,20,29-31</sup> most CPGs did not overlap. Therefore, the differences in quality of CPGs noted in the two studies, were most likely due to true differences in the quality of individual CPGs appraised and not due to differences in the appraisal methodology. The overall quality score mean was also within one point between our appraisal and Hoydonckx et al. Hoydonckx et al. included CPGs on topics potentially tangential to LBP, such as neuropathic pain, which may have contributed to the difference.<sup>9</sup>

Region of publication did not have a significant effect on appraised quality of CPGs. The overall average quality score for all CPGs was 5.20. For US CPGs, the average was 5.56. For CPGs created by UK organizations, the average was 5.42. For CPGs from Europe, the average was 5.19, and for CPGs from the rest of the world, the average was 4.45 (although of note, without CPG #21, which had an overall quality score of 2.5, the average was 4.94). Based on a one-way ANOVA, no association was found between region of publication and quality of CPG, with  $p = .37$ . It is comforting to note

that despite differences in composition of CPG development groups as well as background and cultural differences, the CPG development process and the body of literature that the CPGs included were sufficiently sound such that the quality of CPGs produced by these regions did not vary significantly.

The domain scores of the CPGs not from the United States, United Kingdom, or Europe scored lower than those from the United States, United Kingdom, and Europe in every domain, except for domain 4 (clarity of presentation) where the non-US/UK/Europe group average was 79% compared to 77% for the United Kingdom. For the CPGs from the United States, United Kingdom, and Europe, the domain averages were closest in domain 1 (scope and purpose; United States 81%, United Kingdom 85%, Europe 82%) and overall average (United States 71%, United Kingdom 71%, Europe 70%). The greatest difference between domain averages was in domain 4 (clarity of presentation) where the United Kingdom was 77% as opposed to 84% for the United States and 85% for Europe, domain 5 (applicability) for which the United Kingdom was 56%, the United States was 40%, and Europe 44%, and domain 6 (editorial independence) where the United States was 82%, the United Kingdom was 68%, and Europe was 65%. Overall, despite some differences, most CPGs had similar domain and overall quality scores across regions. These region-based differences in CPG domain quality could be reflective of regional differences in health care systems and administration; however, the differences may not be meaningful given the small sample sizes (most represented region was the United States at nine CPGs) involved. To better evaluate regional differences in CPG quality, studying a greater number of CPGs from a wider variety of disciplines is recommended.

There was no association between year (2009-2020) of development and quality of CPG. This conflicts with Castellini et al. who contended that the more recent CPGs were more reliable/of higher quality.<sup>10</sup> Although it is possible that current CPG quality has improved compared to CPGs older than 2009, recent (11 years or less) LBP CPG development appears to have matured to a

**TABLE 4** Interrater reliability results of clinical practice guidelines domain scores [Correction added on 04 August 2022, after first online publication: columns “CPGs (n)” and “Raters (n)” have been removed from Table 4 in this version. A footnote has been added to Table 4 as well.]

AGREE II domain	ICC (random)	Lower 95% CI	Upper 95% CI	p value
1: Scope and purpose	.887	.781	.949	<.001
2: Stakeholder involvement	.887	.780	.949	<.001
3: Rigor of development	.960	.922	.982	.000
4: Clarity of presentation	.792	.595	.906	<.001
5: Applicability	.835	.679	.926	<.001
6: Editorial independence	.792	.595	.906	<.001

There were 21 CPGs and 4 raters for each domain.

Abbreviations: AGREE II, appraisal of guidelines for research and evaluation II; CI, confidence interval; CPG, clinical practice guideline; ICC, intraclass correlation coefficient.

point of relative stability. For example, the 2009 CPG was of higher quality than several more recent CPGs.

Of the CPGs in this appraisal, 7 were updates and 14 were new. Of the 7 updated CPGs, the average overall quality score was 5.54, compared to 5.04 for the 14 new CPGs (not statistically significant). However, it is important for CPGs to be periodically updated to include new relevant research, as its importance is reflected in a corresponding item in the AGREE II instrument.

The interrater agreement of domain scores in the AGREE II appraisal being high indicates that the appraisals were reliable. The appraisal protocol of our study was similar to that of Hoydonckx et al.,<sup>9</sup> but the appraisers in Castellini et al.'s study<sup>10</sup> went through two rounds of calibration with four sets of unrelated CPGs. This study's appraisal findings were similar to that of Hoydonckx et al.<sup>9</sup> and different from Castellini et al.'s appraisal.<sup>10</sup> Therefore, it is possible that despite the high interrater reliability, the accuracy of our appraisal could improve with more appraisal training. The range of average overall quality scores indicates the importance of the appraisal process as a tool to examine the quality of a CPG and frame its recommendations in the context of the CPG's quality.

## LIMITATIONS

Although our appraisal of LBP CPGs covered a broad range of quality, regions, topics, and publishing organizations and had a high interrater reliability, there are still a number of aspects that must be considered when examining this appraisal. First, for a third order systematic review (umbrella review) such as this, the strength of the findings and conclusions are directly related to the evidence from the examined available studies in the literature. It stands to reason that as time goes on and the quality of data improves, the findings in an appraisal of that data would also improve.

The English language restriction is a possible limitation as well, as there are a number of CPGs that might have been useful for this appraisal that were not published in English language. However, this appraisal was still able to gather CPGs from a wide array of regions around the world.

In terms of the other inclusion and exclusion criteria, three major groups of CPGs that were not included in our review were those related to surgery, those related to imaging, and those that focused on acute LBP. All three of these topics are relevant and important in the treatment of LBP, but to narrow the focus of the study (and the number of CPGs to be appraised) they were excluded from the study criteria of this appraisal. Each of these topics could easily warrant its own appraisal.

Important to note as well is the nature of the AGREE II tool. It is a useful tool but remains inherently subjective. Our appraisers were familiar with AGREE II and had the minimum recommended training but did

not have extensive prior experience using the tool. So, despite high interrater reliability, the relative inexperience of the appraisers is a limitation that needs acknowledgment.

## CONCLUSIONS

The majority of the 21 LBP CPGs that were identified in this systematic review were of high quality. The year of publication, the creating organization, the region of publication, and whether a CPG is an update or not appear to have no association with the CPG quality. Some domains such as "applicability" scored lower in all CPGs analyzed, revealing opportunity for emphasis and improvement in future CPGs.

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## REFERENCES

1. Cassidy JD, Carroll LJ, Côté P. The Saskatchewan health and back pain survey. The prevalence of low back pain and related disability in Saskatchewan adults. *Spine (Phila Pa 1976)*. 1998; 23(17):1860-1866.
2. Murray CJ, Atkinson C, Bhalla K, et al. The state of US health, 1990-2010: burden of diseases, injuries, and risk factors. *JAMA*. 2013;310(6):591-608.
3. Manchikanti L, Falco FJ, Singh V, et al. An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part I: introduction and general considerations. *Pain Physician*. 2013;16(2 suppl):S1-S48.
4. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *Spine J*. 2008;8(1):8-20.
5. Abbott ZI, Nair KV, Allen RR, Akuthota VR. Utilization characteristics of spinal interventions. *Spine J*. 2012;12(1):35-43.
6. Savigny P, Kuntze S, Watson P, et al. *Low Back Pain: Early Management of Persistent Non-Specific Low Back Pain*. London, England: National Collaborating Centre for Primary Care and Royal College of General Practitioners; 2009.
7. Institute of Medicine (US) Committee on Standards for Developing Trustworthy Clinical Practice Guidelines. In: Graham R, Mancher M, Miller Wolman D, et al., eds. *Clinical Practice Guidelines we Can Trust*. Washington, DC: National Academies Press (US); 2011. <https://www.ncbi.nlm.nih.gov/books/NBK209539/>
8. Côté AM, Durand MJ, Tousignant M, Poitras S. Physiotherapists and use of low back pain guidelines: a qualitative study of the barriers and facilitators. *J Occup Rehabil*. 2009;19(1):94-105.
9. Hoydonckx Y, Kumar P, Flamer D, et al. Quality of chronic pain interventional treatment guidelines from pain societies: assessment with the AGREE II instrument. *Eur J Pain*. 2020;24(4): 704-721.
10. Castellini G, Iannicelli V, Briguglio M, et al. Are clinical practice guidelines for low back pain interventions of high quality and updated? A systematic review using the AGREE II instrument. *BMC Health Serv Res*. 2020;20(1):970.
11. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ*. 2009;339:b2700.
12. Ju H, Docter S, Newton S, Merlin T, Hiller JE. *The Management of Acute/Subacute Soft Tissue Injuries to the Low Back: Evidence Update and Recommendations for Clinical Practice*.

- Adelaide, Australia: Adelaide Health Technology Assessment (AHTA); 2009. <http://www.workcover.com/public/download.aspx?id=2904>
13. Van Wambeke P, Desomer A, Ailliet L, Berquin A, Demoulin C, Depreitere B, Dewachter J, Dolphens M, Forget P, Fraselle V, Hans G, Hoste D, Mahieu G, Michielsen J, Nielens H, Orban T, Parlevliet T, Simons E, Tobbacx Y, Van Schaeysbroeck P, Van Zundert J, Vanderstraeten J, Vlaeyen J, Jonckheer P. Low back pain and radicular pain: assessment and management. Good Clinical Practice (GCP) Brussels: Belgian Health Care Knowledge Centre (KCE). 2017. KCE Reports 287. D/2017/10. 273/36.
  14. Chou R, Loeser JD, Owens DK, et al. Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: an evidence-based clinical practice guideline from the American Pain Society. *Spine (Phila Pa 1976)*. 2009;34(10):1066-1077.
  15. Cohen SP, Bhaskar A, Bhatia A, et al. Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group. *Reg Anesth Pain Med*. 2020;45(6):424-467.
  16. Pangarkar SS, Kang DG, Sandbrink F, et al. VA/DoD clinical practice guideline: diagnosis and treatment of low Back pain. *J Gen Intern Med*. 2019;34(11):2620-2629.
  17. EBHC KT (SA) - Chair of Evidence-based Healthcare and Knowledge translation CoM, King Saud University. KSUMC Evidence-Based Clinical Practice Guideline for Management of Persistent non-specific low back pain (KSUMC CPG 1st Edition 2013): Adapted from source CPG: Low back pain: early management of persistent non-specific low back pain (CG 88–2009) National Collaborating Centre for Primary Care (NCCPC), Royal College of General Practitioners (RCGP) and National Institute of Health and Care Excellence (NICE). 2013. [https://faculty.ksu.edu.sa/sites/default/files/low\\_back\\_pain\\_cpg\\_final\\_2014.pdf](https://faculty.ksu.edu.sa/sites/default/files/low_back_pain_cpg_final_2014.pdf).
  18. National Institute for Health and Care Excellence (NICE). Low back pain and sciatica in over 16s: assessment and management. London: National Institute for Health and Care Excellence (UK); 2020 Dec 11. (NICE Guideline, No. 59.) <https://www.ncbi.nlm.nih.gov/books/NBK562933/>.
  19. Institute for Clinical Systems Improvement (ICSI). Adult acute and subacute Low back pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2018 Mar. 49 p. GUIDELINE ID: 1524. 2018. <https://www.icsi.org/wp-content/uploads/2019/08/March-2018-LBP-Interactive2.pdf>.
  20. Itz CJ, Willems PC, Zeilstra DJ, Huygen FJ, Dutch Society of Anesthesiologists; Dutch Orthopedic Association; Dutch Neurosurgical Society. Dutch multidisciplinary guideline for invasive treatment of pain syndromes of the lumbosacral spine. *Pain Pract*. 2016;16(1):90-110.
  21. Manchikanti L, Kaye AD, Soin A, et al. Comprehensive evidence-based guidelines for facet joint interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians (ASIPP) guidelines facet joint interventions 2020 guidelines. *Pain Physician*. 2020;23(3S):S1-S127.
  22. Lee J, Gupta S, Price C, Baranowski AP. Low back and radicular pain: a pathway for care developed by the British Pain Society. *Br J Anaesth*. 2013;111(1):112-120.
  23. Lee JH, Choi KH, Kang S, et al. Nonsurgical treatments for patients with radicular pain from lumbosacral disc herniation. *Spine J*. 2019;19(9):1478-1489.
  24. Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations. *Pain Physician*. 2013;16(2 suppl):S49-S283.
  25. Stockendahl MJ, Kjaer P, Hartvigsen J, et al. National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy. *Eur Spine J*. 2018;27(1):60-75.
  26. Navani A, Manchikanti L, Albers SL, et al. Responsible, safe, and effective use of biologics in the management of low back pain: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician*. 2019;22(1S):S1-S74.
  27. North American Spine Society (NASS). Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care: Diagnosis and Treatment of Low Back Pain. Published January 29, 2020. <https://www.spine.org/Portals/0/assets/downloads/ResearchClinicalCare/Guidelines/LowBackPain.pdf>
  28. Airaksinen O, Brox JI, Cedraschi C, et al. Chapter 4 European guidelines for the management of chronic nonspecific low back pain. *Eur Spine J*. 2006;15:S192-S300.
  29. Parfenov VA, Yakhno NN, Davydov OS, et al. Chronic non-specific (musculoskeletal) low back pain. Guidelines of the Russian Society for the Study of Pain (RSSP). *Neurol Neuropsychiatry Psychosom*. 2019;11(2S):7-16.
  30. Toward Optimized Practice (TOP) Low Back Pain Working Group. *Minor Revision 2017 (3rd Edition) Evidence-Informed Primary Care Management of Low Back Pain: Clinical Practice Guideline*. Alberta, Canada: Toward Optimized Practice; 2015. <http://www.topalbertadoctors.org/cpgs/885801>
  31. Watters WC 3rd, Resnick DK, Eck JC, et al. 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. *J Neurosurg Spine*. 2014;21(1):79-90.
  32. Dijkers MP, Ward I, Annaswamy T, et al. Quality of rehabilitation clinical practice guidelines: an overview study of AGREE II appraisals. *Arch Phys Med Rehabil*. 2020;101(9):1643-1655.
  33. Hoffmann-Eüer W, Siering U, Neugebauer EAM, Brockhaus AC, Lampert U, Eikermann M. Guideline appraisal with AGREE II: Systematic review of the current evidence on how users handle the 2 overall assessments. *PLoS ONE*. 2017;12(3):e0174831. <https://doi.org/10.1371/journal.pone.0174831>.

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